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2                   **UNITED STATES DISTRICT COURT**  
3                   **CENTRAL DISTRICT OF CALIFORNIA**

4                   BERNADINE GRIFFITH; et al.,  
5                   individually and on behalf of all others  
6                   similarly situated,

7                   Plaintiffs,

8                   vs.

9                   TIKTOK, INC., a corporation;  
10                  BYTEDANCE, INC., a corporation

11                  Defendants.

12                  Case No. 5:23-cv-00964-SB-E

13                  **DECLARATION OF RUSSELL  
14                  W. MANGUM III PH.D. IN  
15                  SUPPORT OF PLAINTIFFS'  
16                  MOTION FOR CLASS  
17                  CERTIFICATION**

18                  **REDACTED VERSION OF  
19                  DOCUMENT PROPOSED TO BE  
20                  FILED UNDER SEAL**

21                  I, Russell W. Mangum III, declare as follows:

22                  1. Counsel for Plaintiffs retained me to provide expert analysis and, if  
23                  requested, expert testimony. I have personal knowledge of the matters set forth herein  
24                  and am competent to testify.

25                  2. I submit this declaration in connection with Plaintiffs' Motion for Class  
26                  Certification.

27                  3. Attached is a true and correct copy of the Expert Declaration that I  
28                  prepared in connection with this matter, dated June 21, 2024. The opinions I provided  
29                  therein are true and correct to the best of my knowledge.

30                  4. This Declaration contains statements of my opinions formed to date and  
31                  the bases and reasons for those opinions. I understand from counsel that discovery in  
32                  this case is ongoing, and I may offer additional opinions based on further review of  
33                  materials in this case. I reserve the right to amend or supplement my opinions based  
34                  on further discovery and information provided in this case that was not available to  
35                  me at the time I prepared this Declaration.

1 I declare under penalty of perjury under the laws of the United States of  
2 America that the foregoing is true and correct. Executed this 21st of June, 2024, at  
3 Irvine, California.

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Russell W. Mangum III

7 Russell W. Mangum III

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**IN THE UNITED STATES DISTRICT COURT  
FOR THE CENTRAL DISTRICT OF CALIFORNIA**

BERNADINE GRIFFITH, et al.,  
individually and on behalf of all  
others similarly situated,

Plaintiffs,

v.

TIKTOK, INC., a corporation;  
BYTEDANCE, INC., a corporation,

Defendants.

Case No. 5:23-cv-00964-SB-E

**DECLARATION OF RUSSELL W. MANGUM III, PH.D. IN SUPPORT  
OF PLAINTIFFS' MOTION FOR CLASS CERTIFICATION**

**June 21, 2024**

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I, Russell Mangum III, declare the following:

**I. EXECUTIVE SUMMARY**

**I.A. Assignment**

1. I have been engaged by Bird, Marella, Rhoads, Lincenberg, Drooks & Nessim, LLP, Glancy Prongay & Murray LLP, and Susman Godfrey LLP, counsel for the putative class, to provide expert analysis, and, if necessary, expert testimony in the above listed matter pending in the United States District Court for the Central District of California, under Case No. 5:23-cv-00964-SB-E. I understand Plaintiffs Bernadine Griffith, Patricia Shih, and Jacob Watters (“Plaintiffs,” and together with all putative class members, “Class Members”) have accused TikTok, Inc. (“TikTok”) and ByteDance, Inc. (“ByteDance”) (collectively, “Defendants”) of the “unauthorized interception, collection, storing and use of non-TikTok users’ personal data whenever the non-TikTok users visit a non-TikTok website with the TikTok SDK installed.”<sup>1</sup> I have been asked to undertake the following tasks relating to an assessment of the economic impact to Plaintiffs and Class Members resulting from Plaintiffs’ allegations against Defendants:

- Determine the feasibility of calculating class-wide damages in this action attributable to Defendants’ alleged misconduct and Plaintiffs’ alleged theories of liability; and
- Evaluate appropriate methodologies by which the magnitude of class-wide impact can be determined.

2. I understand that at this stage of the legal proceedings, Plaintiffs are filing a motion for class certification. I have been requested to submit this declaration to address, from an economic perspective, certain issues that may be pertinent to the class certification analysis. I understand the inquiry into the merits of the case will occur at some later date, at which time I may be called upon to offer further analysis or testimony.

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<sup>1</sup> Second Amended Class Action Complaint, Apr. 11, 2024 (“Complaint”), p. 2.

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3. My analysis is conducted through an evaluation of evidence relevant to the facts of the case available at the time of submitting this declaration. Given the ongoing nature of the case and the open status of discovery, if additional information becomes available, I will update, modify, and/or supplement my analyses and opinions as appropriate. I may also modify or supplement my opinions in view of opinions or arguments made by any person Defendants retain, including their counsel and anyone they engage to provide opinions.
4. I understand this case has been brought against Defendants on behalf of a putative class. I understand that Plaintiffs seek to certify the following classes and subclasses:
  - **Class 1: Nationwide Pixel Class:** All natural persons residing in the United States who visited a website using the TikTok Pixel from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
  - **Subclass 1: California Pixel Subclass:** All natural persons residing in the state of California who visited a website using the TikTok Pixel from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
  - **Class 2: Nationwide Pixel and Events API Class:** All natural persons residing in the United States who visited a website using the TikTok Pixel and whose server uses the TikTok Events API from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
  - **Subclass 2: California Pixel and Events API Subclass:** All natural persons residing in the state of California who visited a website using the TikTok Pixel and whose server uses the TikTok Events API from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
  - **Class 3: Nationwide Pixel Cookie-Blocking Class:** All natural persons residing in the United States who visited a website using the TikTok Pixel from March 2022 to the present, who have never been registered users of the TikTok app or held any TikTok account, and who had web browser or system settings turned on to block third-party cookies.

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- **Subclass 3: California Pixel Cookie-Blocking Subclass:** All natural persons residing in the state of California who visited a website using the TikTok Pixel from March 2022 to the present, who have never been registered users of the TikTok app or held any TikTok account, and who had web browser or system settings turned on to block third-party cookies.
- **Class 4: Nationwide Pixel and Events API Cookie-Blocking Class:** All natural persons residing in the United States who visited a website using the TikTok Pixel and whose server uses the TikTok Events API from March 2022 to the present, who have never been registered users of the TikTok app or held any TikTok account, and who had web browser or system settings turned on to block third-party cookies.
- **Subclass 4: California Pixel and Events API Cookie-Blocking Subclass:** All natural persons residing in the state of California who visited a website using the TikTok Pixel and whose server uses the TikTok Events API from March 2022 to the present, who have never been registered users of the TikTok app or held any TikTok account, and who had web browser or system settings turned on to block third-party cookies.
- **Class 5: Nationwide ECPA Class:** All natural persons residing in the United States who have never been registered users of the TikTok app or held any TikTok account, and, from March 2022 to the present, visited a website using the TikTok Pixel but without “Search” as an optional event from the TikTok Pixel configuration menu.
- **Subclass 5: California ECPA Subclass:** All natural persons residing in the state of California who have never been registered users of the TikTok app or held any TikTok account, and, from March 2022 to the present, visited a website using the TikTok Pixel but without “Search” as an optional event from the TikTok Pixel configuration menu.

5. I understand that, in the alternative, Plaintiffs seek to certify the following classes and subclasses:

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- **Class 6: The Rite Aid Nationwide Class:** All natural persons residing in the United States who visited the Rite Aid website from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
- **Subclass 6: The Rite Aid California Subclass:** All natural persons residing in the state of California who visited the Rite Aid website from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
- **Class 7: The Hulu Nationwide Class:** All natural persons residing in the United States who visited the Hulu website from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
- **Subclass 7: The Hulu California Subclass:** All natural persons residing in the state of California who visited the Hulu website from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
- **Class 8: The Etsy Nationwide Class:** All natural persons residing in the United States who visited the Etsy website from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
- **Subclass 8: The Etsy California Subclass:** All natural persons residing in the state of California who visited the Etsy website from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
- **Class 9: The Upwork Nationwide Class:** All natural persons residing in the United States who visited the Upwork website from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.
- **Subclass 9: The Upwork California Subclass:** All natural persons residing in the state of California who visited the Upwork website from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.

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- **Class 10: The Sweetwater Nationwide Class:** All natural persons residing in the United States who visited the Sweetwater website from March 2022 to the present, and who have never been registered users of the TikTok app or held any TikTok account.

6. I understand from counsel that the Class Period is defined as from March 2022 through the present.
7. As noted above and discussed more fully below, the allegations I have been asked to address relate to Defendants' unauthorized use and economic gains related to its gathering and/or use of Plaintiffs' and Class Members' private and personal information.
8. For the purposes of my analyses, I have been asked to assume Defendants are liable.

### I.B. Qualifications

9. I am the Executive Vice President of Cirque Analytics, an economic consulting firm established in 2021 with offices in Irvine, California, Los Angeles, California, Jackson Hole, Wyoming, and Washington DC. Cirque Analytics provides economic, financial, and statistical research and analysis to private and public sector clients in the United States and abroad. I also was a Professor at Concordia University Irvine, School of Business and Economics, from 2013 to 2022.
10. I hold a Ph.D. and a M.A. in economics from the University of Southern California, and a BA in economics, with honors, from California State University, Fullerton. I have been actively employed in the area of economic analysis for over 25 years. After completing my graduate education, I served as an economist with the US Federal Trade Commission, Bureau of Economics, from July 1995 through August 1998. After leaving the Commission, I held positions as an economist and expert for Nathan Associates, PricewaterhouseCoopers, and Analysis Group. In 2021, I joined Cirque Analytics. I have been a professor and taught courses at Johns Hopkins University, The University of Southern California, Pepperdine University, and Concordia University Irvine, where I retired in 2022. I also served as a Visiting Researcher at the University of Winchester, UK, in the Faculty of Business, Law and Digital Technology.

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11. I am or have been a member of several professional associations, including the American Economic Association, the Orange County Intellectual Property Law Association, the Los Angeles Intellectual Property Law Association, the American Bar Association, and the Licensing Executives Society, for which I previously served as the Chair of the Orange County Chapter. I have written articles and given presentations on various aspects of economic damages.
12. I have often analyzed issues related to various economic matters, including economic impact and commercial damages. I have analyzed such claims and damages in many different industries, such as electronics, software, semiconductors, telecommunications, oil refining, agriculture, medical instruments, music and entertainment, apparel, and various consumer goods. I have been qualified as an expert in both state and federal courts and have analyzed and provided opinions regarding economic impacts in many cases, for both plaintiffs and defendants.
13. Cirque Analytics charges \$870 per hour for my work in this matter. Professional staff members employed by Cirque Analytics also assist me. Neither my compensation nor Cirque Analytics' is contingent upon the outcome of this case.
14. My curriculum vitae is attached to this declaration as **Appendix 1**. Also included in **Appendix 1** is a list of the matters in which I have testified at deposition or trial in the past four years, along with a list of my publications for at least the past ten years.

### I.C. Documents Reviewed

15. In conducting my analysis, I, or supporting staff at my direction, have reviewed various documents and materials produced in this case. Those documents include, but are not limited to, materials produced by Defendants, Defendants' interrogatory responses, legal materials filed as part of this action, deposition testimony, publicly available materials, a conversation with Plaintiffs' technical expert Dr. Zubair Shafiq, as well as academic and legal research. The set of documents, materials, and information I considered are listed in this declaration or in the attached **Appendix 2**.

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16. I have had full access to every document produced in this case, using a document review platform provided by Everlaw, and to all deposition transcripts,<sup>2</sup> written discovery responses, and data produced. I was freely allowed to conduct searches and view any document for the purpose of preparing this declaration.

**I.D. Summary of Preliminary Conclusions**

17. Based on my analysis and review of the evidence and the facts of the case available to date, I have determined the following:

- Assessment of economic remedies attributed to Defendants' alleged wrongdoing is feasible on a class-wide basis based even on the limited available evidence and data produced to date.
- The data and methodology relevant to the assessment and computation of economic impact is common to the class.
- The personal information that TikTok collected from Class Members has economic value, as shown through payments that other companies have made to consumers for the collection and use of similar information.
- Defendants earned revenues from the collection and/or use of Class Members' data.
- From an economic standpoint, Class Members were impacted and continue to be impacted by TikTok's unauthorized collection and/or use of data, in at least the following ways:
  - i. Defendants obtained and continues to obtain valuable Class Member data without Class Members being compensated for the collection and/or use of that data.
  - ii. The economic value associated with each Class Member's data subject to Defendants' unauthorized collection and/or use may be quantified based on publicly available data that can be used to determine a market value. I find that the economic value of a Class Member's data is valued at up to \$3 per Class Member per month.

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<sup>2</sup> As of the date of this declaration, I have only received the rough deposition transcript of Simran Sahni and do not incorporate that testimony in this declaration.

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18. The conclusions in this Declaration are preliminary, given the ongoing nature of the case and the open status of discovery. I reserve the right to update, modify, and/or supplement my analyses and opinions if additional information becomes available, and in view of opinions or arguments made by any person Defendants retain, including their counsel and anyone they engage to provide opinions.

## II. BACKGROUND

### II.A. Summary of Allegations

19. TikTok states that it considers and cares about TikTok users and their privacy. [REDACTED]  
[REDACTED]  
[REDACTED] It is alleged that the same is not true for non-TikTok users.
20. Plaintiffs allege that Defendants unlawfully collect and store personal data of U.S. individuals that are not and have not registered for the TikTok application (i.e., non-TikTok users).<sup>4</sup> According to Plaintiffs, Defendants intercept and collect data while individuals browse non-TikTok websites, regardless of whether an individual is a TikTok user.<sup>5</sup> Defendants collect these data through the TikTok Pixel, installed on websites with no affiliation with TikTok, and through the TikTok Events API, a server-to-server data tracking mechanism similar to the Pixel.<sup>6</sup> (Consistent with the Complaint, I refer to the Pixel and Events API together as the “TikTok SDK.”) In addition, Defendants collect these data from websites with no disclosed relation or affiliation with Defendants, and the websites do not disclose that data on their website visitors are collected and sent to TikTok.<sup>7</sup>

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<sup>3</sup> [REDACTED] (TIKTOK-BG-000002930-940 at 935).

<sup>4</sup> Complaint, pp. 2–3.

<sup>5</sup> Complaint, pp. 3–4.

<sup>6</sup> Complaint, p. 4; Declaration of Zubair Shafiq, Ph.D. in Support of Plaintiffs’ Motion for Class Certification, June 21, 2024 (“Shafiq Declaration”), Sections IV and V; Conversation with Dr. Shafiq.

<sup>7</sup> Complaint, pp. 3 and 15.

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21. According to Plaintiffs, Defendants' software that enables the collection of website visitor data has been installed on hundreds of thousands of websites.<sup>8</sup> Examples of websites from which Defendants collect, or in the past have collected, website visitor data include: Hulu, Upwork, Build-a-Bear Workshop, Rite Aid, The Vitamin Shoppe, WebMD, Weight Watchers, The Planned Parenthood Federation of America, Cerebral, Recovery Centers of America, SmartAsset, Happy Money, United Methodist Church, Girl Scouts of the USA, Maryland Department of Health, and Arizona Department of Economic Security.<sup>9</sup>
22. Examples of the types of personal data collected by Defendants include contact information (e.g., phone numbers and emails addresses), identifiers (IP addresses, user IDs, and user agents), and browsing data (e.g., webpage visits, search queries).<sup>10</sup> Additional sensitive data may also be collected, such as health-related data, including patient names, date of birth, appointment schedules, and insurance details.<sup>11</sup>
23. Through Defendants' collection of personal data, Class Members have been harmed through the unauthorized transfer and/or use of their data that has economic value.<sup>12</sup> In addition, through the collection of Class Members' data, Defendants have benefited financially.<sup>13</sup> Furthermore, Class Members have experienced reduced privacy.<sup>14</sup>

## II.B. Plaintiffs and Class Members

24. The Complaint asserts allegations on behalf of certain Class Members. I understand that none of the Plaintiffs registered for a TikTok account or signed into the TikTok app or web platform and yet each Plaintiff had his or her personal information taken by TikTok through the TikTok SDK without his or her permission.<sup>15</sup>

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<sup>8</sup> Complaint, p. 21. *See also* TIKTOK-BG-000002788–793.

<sup>9</sup> Complaint, pp. 24–25.

<sup>10</sup> Complaint, p. 15; Shafiq Declaration, Section V.A.; Conversation with Dr. Shafiq.

<sup>11</sup> Complaint, p. 22.

<sup>12</sup> Complaint, pp. 31–34.

<sup>13</sup> Complaint, pp. 31–34.

<sup>14</sup> Complaint, p. 32.

<sup>15</sup> Complaint, pp. 35–42.

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## II.C. Defendants and the Technology At-Issue

### II.C.1. ByteDance and TikTok

25. ByteDance was founded in 2012 and launched a product called Douyin in September 2016. Douyin is a mainland Chinese short video application. ByteDance acquired Musical.ly in November 2017. ByteDance has more than 150,000 employees and is a private company.<sup>16</sup>
26. TikTok Inc. publishes the TikTok platform, the international counterpart to Douyin, in the United States.<sup>17</sup> The TikTok platform was launched in 2017 and allows users to watch and submit videos.<sup>18</sup>

### II.C.2. TikTok Pixel

27. My understanding of the functionality of the TikTok Pixel, including its collection of Class Members' data, is based on my review of the Declaration of Zubair Shafiq, Ph.D. ("Shafiq fDeclaration").<sup>19</sup> In particular, I understand that "TikTok Pixel is JavaScript source code that is embedded on non-TikTok websites."<sup>20</sup> I also understand that the TikTok Pixel "automatically collects the following seven categories of data for all events, including the default 'PageView' event: (a) Timestamp; (b) IP Address; (c) User Agent; (d) Cookies; (e) URL; (f) Event Information; and (g) Content Information."<sup>21</sup>

### II.C.3. TikTok Events API

28. My understanding of the functionality of the TikTok Events API, including its collection of Class Members' data, is based on my review of the Shafiq Declaration. In particular, I

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<sup>16</sup> ByteDance, "Our Mission," accessed Mar. 6, 2024, <https://www/bytedance.com/en/>.

<sup>17</sup> References to "TikTok" are to the specific TikTok Inc. corporate entity that is a Defendant in this lawsuit. References to the "TikTok platform" are to the online platform, which includes both the TikTok mobile app and web browser.

<sup>18</sup> ByteDance, "Our Mission," accessed Mar. 6, 2024, <https://www/bytedance.com/en/>; Adam Birney, "What is the maximum length for a TikTok video in 2024," Feb. 24, 2024, <https://www.androidauthority.com/how-long-are-tiktok-videos-3163309/>.

<sup>19</sup> Shafiq Declaration.

<sup>20</sup> Shafiq Declaration, Section IV.B.; Conversation with Dr. Shafiq.

<sup>21</sup> Shafiq Declaration, Section V.A.

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understand that the Events API is a “server-to-server” data collection mechanism that “circumvents ad blockers and tracking protection features.”<sup>22</sup>

29. The Pixel and the Events API complement each other, and TikTok recommends that businesses utilize both for maximum benefits from targeting ads at users.<sup>23</sup>

## II.D. Consumer Personal Information Data as a Source of Value

30. It is well understood that as a matter of economics, information has value. Information on markets, products, competitors, and/or customers enable companies to make more effective business and profit maximizing decisions.<sup>24</sup> Value associated with information, particularly consumer information, is more than just a theoretical concept. According to the 2019 PwC survey of CEOs, data on customer and client preferences was rated as the most critical category of data.<sup>25</sup> The economic value of user data can be associated with improved marketing and product development decisions, among others. In **Section II.D.1**, I provide a brief set of academic findings to support the finding of the incremental value companies place on personal information and how that can impact advertising and related revenues for companies.

31. The economic literature also acknowledges that consumers have incentives to control how their data are used.<sup>26</sup> There are several underlying economic motivations for controlling how data are used, such as: (1) preventing direct financial losses that are more likely to occur when private information is exposed (e.g., costs from identity theft), (2) avoiding costs imposed by third parties who obtain consumers’ exposed personal information, such as an increased likelihood of unwanted communications from marketers (i.e., spam email, telemarketing calls, and junk mail), and (3) avoiding loss of privacy and/or utility (i.e.,

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<sup>22</sup> Shafiq Declaration, Section IV.C.; Conversation with Dr. Shafiq.

<sup>23</sup> TikTok, “About Events API,” Oct. 2023, available at <https://ads.tiktok.com/help/article/events-api?lang=en>.

<sup>24</sup> See, e.g., Robert S. Pindyck and Daniel Rubinfeld, *Microeconomics* (Upper Saddle River: Pearson Education, Inc., 2013), pp. 174–175.

<sup>25</sup> PwC, “22nd Annual Global CEO Survey,” 2019, available at <https://www.pwc.com/gx/en/ceo-survey/2019/report/pwc-22nd-annual-global-ceo-survey.pdf>.

This is the most recent PwC report that sought such information from the CEOs surveyed.

<sup>26</sup> Alessandro Acquisti, “The Economics of Personal Data and the Economics of Privacy,” *OECD Joint WPISP-WPIE Roundtable*, Dec. 1, 2010, available at <https://www.oecd.org/sti/ieconomy/46968784.pdf>, pp. 15 and 18.

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consumer well-being) stemming from revelation of sensitive information (e.g., the sharing of facts about oneself that are preferred to remain undisclosed). In **Section II.D.2**, I provide a brief set of academic findings to support the finding that consumers may exchange value for varying degrees of protection of their data and information.

**II.D.1. Peer-Reviewed Research Establishes the Incremental Value of Targeted Advertising Compared with Contextual Advertising That Leads to Increased Revenues and Profits to Platforms**

32. This section provides economic evidence of the value of personal information. Companies in a position to obtain personal information, like Defendants, have an economic profit motivation to obtain the data to support advertisers with effective advertising that utilizes personal information. In **Section IV** I then apply this finding to explain how the TikTok SDK plays a role in Defendants' profitability and decision-making.<sup>27</sup>
33. Collecting information from website visitors' browsing activity on the internet has an impact on the effectiveness of advertising. This is done by tailoring what a consumer sees with prior browsing history, data, and collected information.<sup>28</sup> Professor Garrett Johnson (and others) in a 2020 peer-reviewed paper quantified the impact that website tracking mechanisms (e.g., through a cookie, pixel, or events API) can have on advertiser revenues.<sup>29</sup>
34. Professor Johnson et al.'s study found a significant reduction in advertiser revenue for consumers who opted-out of online tracking, which would include receiving personalized

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<sup>27</sup> See, e.g., Deposition of Lizzie Li, June 5, 2024, pp. 195–196.

<sup>28</sup> See, e.g., Anas Baig, "What are Advertising Cookies and How are they used," Securiti, Mar. 4, 2024, <https://securiti.ai/blog/advertising-cookies/>; Learn Web Analytics, "What's the Difference Between a Cookie, a Pixel, and a Tag?" accessed June 18, 2024, <https://learnwebanalytics.com/whats-the-difference-between-a-cookie-a-pixel-and-a-tag/>; GumGum, "Contextual Vs Behavioral Targeting," Dec. 29, 2022, <https://gumgum.com/blog/contextual-vs-behavioral-targeting>.

<sup>29</sup> Garrett A. Johnson, Scott K. Shriver, and Shaoyin Du, "Consumer privacy choice in online advertising: Who opts out and at what cost to industry?" *Marketing Science* 39, no. 1 (Jan.–Feb. 2020): 33–51 ("Johnson 2020"). Johnson 2020 uses the term "publisher," which for this discussion is synonymous with advertiser.

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advertisements.<sup>30</sup> The study was conducted in June 2015 and found a 52 percent reduction in revenue associated with consumers who opted-out of online tracking.<sup>31</sup>

35. The authors note that this “can estimate industry willingness to pay,” but that the authors “are unable to compute consumer’s valuation for privacy.”<sup>32</sup> The individuals then who opt out of personalized ads would have a *greater* valuation of privacy than estimated in Johnson 2020.<sup>33</sup> The results therefore present a reasonable and conservative metric for the outside valuation of a consumers’ private information.
36. The Johnson 2020 results found their way to the public with one author noting that “cookies increase ad prices by a factor of two to three” and that “without behavioral targeting, prices fell by half.”<sup>34</sup> A Google study cited similar findings as the results from Johnson 2020.<sup>35</sup>
37. Additional studies support the findings from Johnson 2020. Goldfarb and Tucker obtained an estimate that “advertising effectiveness decreased on average by around 65 percent” after a cookie-restriction policy was established in Europe.<sup>36</sup> Beales and Eisenach found tracking users would lead to between a 60 percent increase for a “new” user, and 200 percent increase for an “older” user, in terms of price advertisers would pay compared with not being able to track a user.<sup>37</sup>

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<sup>30</sup> The Johnson 2020 analysis utilized a program called the “AdChoices” program that is present on the majority of websites.

<sup>31</sup> Johnson 2020, p. 33.

<sup>32</sup> Johnson 2020, p. 47.

<sup>33</sup> Johnson 2020, p. 47. See also Alessandro Acquisti, Leslie K. John, and George Loewenstein, “What is Privacy Worth?” *The Journal of Legal Studies* 42, no. 2 (June 2013): 249–274; Alecia M. McDonald and Lorrie Faith Cranor, “Americans’ Attitudes About Internet Behavioral Advertising Practices,” *Proceedings of the 9th annual ACM workshop on Privacy in the electronic society*, WPES 2010: 63–72.

<sup>34</sup> Sarah Sluis, “Marketing Professor Garrett Johnson Wants You To Know That Cookies Increase Ad Revenue,” *Ad Exchanger*, Sept. 3, 2019.

<sup>35</sup> See, e.g., Garrett Johnson, @garjoh\_canuck, Twitter, Aug. 22, 2019, [https://twitter.com/garjoh\\_canuck/status/1164566217602031621?s=20](https://twitter.com/garjoh_canuck/status/1164566217602031621?s=20).

<sup>36</sup> Avi Goldfarb and Catherine Tucker, “Privacy Regulation and Online Advertising,” *Management Science* 51, no. 1 (2011): 57–71.

<sup>37</sup> J. Howard Beales and Jeffrey A. Eisenach, “An Empirical Analysis of the Value of Information Sharing in the Market for Online Content,” Navigant Economics, Jan. 2014, pp. 1–15 at 1.

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38. These studies have demonstrated how advertisers value behavioral advertising and the personal information on which it relies.

**II.D.2. Peer-Reviewed Research Establishes the Value Individuals May Place on Protecting Personal Information and Their Privacy**

39. To set the stage qualitatively for my market measure analysis below in **Section V**, I start by considering academic peer-reviewed research on the value of data privacy. This review is not meant to be exhaustive. Instead, I aim to demonstrate that there are findings in the academic sphere relevant to my later findings of what occurs in the actual marketplace when consumers and companies exchange money for goods and services.

40. In the first paper I will review, tradeoffs individuals make between personal information protection and internet browsing features are studied through conjoint analysis, which enables the estimation of value of personal information protection.<sup>38</sup> Dr. Il-Horn Hann, Dr. Kai-Lung Hui, Dr. Sang-Yong Tom Lee, and Dr. Ivan P. L. Png conducted a survey and conjoint analysis addressing this issue of personal information protection in the *Journal of Management Information Systems*.<sup>39</sup>

41. Hann et al. conducted a study to assess the value online consumers place on privacy concerns and potential benefits of sharing personal information with a website. Specifically, Hann et al. analyzed three privacy concerns: 1) deliberate or accidental errors in the user's personal data; 2) improper access to personal information, where a user's personal information is not restricted to authorized personnel; and 3) secondary use of personal data, where the personal information provided may be used for purposes other than the primary or stated purpose. Hann et al. also looked at two potential benefits of sharing personal information with

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<sup>38</sup> Conjoint analysis is a quantitative assessment of consumers' value associated with a particular feature of a product or service while controlling for other exogenous features and market factors. A basic objective of conjoint analysis is to allocate the utility of a product or service into values attributable to individual features and attributes. For example, consumers may be asked to select products with varying features and product prices. Ultimately, conjoint analysis quantifies the tradeoffs consumers make between features, prices, or other factors. See Paul Green and V. Srinivasan, "Conjoint Analysis in Consumer Research: Issues and Outlook," *The Journal of Consumer Research* 5, no. 2 (Sept. 1978): p. 103; and Anders Gustafsson, Andreas Herrmann, and Frank Huber, *Conjoint Measurement: Methods and Applications* (Springer, 2003), pp. 7–8.

<sup>39</sup> Il-Horn Hann, Kai-Lung Hui, Sang-Yong Tom Lee and Ivan P. L. Png, "Overcoming Online Information Privacy Concerns: An Information-Processing Theory Approach," *Journal of Management Information Systems* 24, no. 2 (2007): pp. 13–42 ("Hann et al.").

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websites: 1) monetary rewards or promotions that websites may offer, such as discounts, free shipping or products, or simple cash incentives, in exchange for personal information; and 2) the convenience / time savings that a user receives when providing personal information to a website that the consumer accesses with some level of frequency. The 268 survey respondents from the US and Singapore were asked to rank, from “most preferred” to “least preferred,” eighteen hypothetical website portals with differing characteristics according to the five dimensions (error review, improper access, unauthorized secondary use, monetary reward, and time savings) above. Hann et al. then analyzed the trade-offs between the various privacy and benefit outcomes to determine the marginal utility of each dimension as measured by the rank assigned to the websites by the respondent.<sup>40</sup>

42. Hann et al. confirm that users are willing to give up some of their privacy for economic incentives, and they estimate the value that online consumers place on the different dimensions of privacy. The survey respondents were willing to trade one-time monetary rewards for varying characteristics of the website. In addition, Hann et al. find that when a website has a privacy policy that restricts against improper access of personal information, survey respondents rank that website higher, similar to not allowing for secondary use.<sup>41</sup> These tradeoffs translate into valuations of additional privacy.
  
43. Totaling the values of one-time payments, the authors found that protection against improper access and secondary use of personal information is worth between \$29.34 and \$42.94 (in 2024 dollars).<sup>42</sup> This calculation adjusts for inflation from when the study was conducted to

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<sup>40</sup> Hann et al., pp. 22–23.

<sup>41</sup> Hann et al., Table 2, p. 27.

<sup>42</sup> The range in value that respondents placed on restriction against improper access of personal information was found to vary between \$11.33 and \$16.58 (in 2007 dollars).  $(3.007 \text{ marginal utility}) \div (0.181 \text{ marginal utility per dollar}) = \$16.58$ .  $(3.007 \text{ marginal utility}) \div (0.265 \text{ marginal utility per dollar}) = \$11.33$ . To measure the value of restriction against improper access Hann et al. assigned the different web portals that the survey respondents were asked to rank, one of the two following characteristics: either the portal stated that 1) it had no policy on access to personal information or that 2) only authorized personnel from within the company, who have been trained in privacy issues, would be able to access to the personal information.

They also found a range of values between \$7.98 and \$11.68 (in 2007 dollars) for not allowing secondary use. Hann et al., Table 3.

Hann et al. assigned each web portal one of two characteristics relating to the secondary use to ascertain the value users placed on that restriction. The portal stated either states that 1) the personal information will not be used for any purpose other than its intended use (for facilitating stock quotations or transactions in the financial portal example) or that 2) the personal information may be analyzed for other purposes, such as revealing the user's Web usage preferences.

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today. But this does not account for any increase in value consumers place on their personal information protection since the Hann et al. study was conducted.<sup>43</sup> [REDACTED]

44. Further support of the value that individuals place on the protection and restriction of their personal information is found in another academic study conducted by Hanna Krasnova, Thomas Hildebrand, and Oliver Guenther.<sup>45</sup> Krasnova et al. looked at online social networks (OSNs) to assess the value that participants place on different OSN attributes, including the use of personal information by the OSN provider. Krasnova et al. found that an average user would be willing to spend between \$27.89 and \$34.01 (in 2024 dollars) *per year* if the OSN provider refrained from using the demographic information provided for personalized advertising.<sup>46</sup>

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Since the values are calculated for each component based on that component's individual marginal utility, the dollar values can simply be added together. As a lower bound:  $\$11.33 + \$7.98 = \$19.31$ ; and as an upper bound:  $\$16.58 + \$11.68 = \$28.26$ .

Using the Consumer Price Index for All Urban Consumers (CPI-U) US city average series for all items (not seasonally adjusted) to convert April 2007 dollars to June 2024, results in a ratio of 1.52. BLS, "CPI Inflation Calculator," available at [https://www.bls.gov/data/inflation\\_calculator.htm](https://www.bls.gov/data/inflation_calculator.htm); BLS, "Databases, Tables & Calculators by Subject," available at <https://data.bls.gov/timeseries/CUUR0000SA0>.

<sup>43</sup> Concern over privacy and personal data use has only increased over time. See, e.g., Swish Goswami, "The Rising Concern Around Consumer Data And Privacy," *Forbes*, Dec. 14, 2020, <https://www.forbes.com/sites/forbestechcouncil/2020/12/14/the-rising-concern-around-consumer-data-and-privacy/>. See also a 2018 SAS survey of over 500 US consumers, in which "Almost three-fourths (73 percent) of survey participants said they are more concerned about their data privacy now than they were a few years ago." SAS, "Data Privacy: Are You Concerned," available at <https://www.sas.com/en/whitepapers/data-privacy-110027.html>. In 2021 KPMG conducted a similar survey of 2,000 adults in the US and found that the vast majority of respondents "say data privacy is a growing concern." Orson Lucas, "Corporate data responsibility," KPMG, Aug. 2021, available at <https://advisory.kpmg.us/content/dam/advisory/en/pdfs/2021/corporate-data-responsibility-bridging-the-consumer-trust-gap.pdf>. In addition, since the Hann et al. study was conducted, the EU passed the GDPR and California signed the CCPA.

<sup>44</sup> [REDACTED] (TIKTOK-BG-000009006-9028 at 9008).

<sup>45</sup> Hanna Krasnova, Thomas Hildebrand, and Oliver Guenther, "Investigating the Value of Privacy in Online Social Networks: Conjoint Analysis," *ICIS 2009 Proceedings*, paper 173, 2009 ("Krasnova et al.").

<sup>46</sup> Krasnova et al., p. 15. Euros were converted to USD using the January 2009 exchange rate of 1.324 USD to Euro. Next January 2009 dollars were converted to May 2024 dollars by a factor of 1.49 by using the CPI inflation calculator. Federal Reserve, "Foreign Exchange Rates," available at [https://www.federalreserve.gov/releases/h10/hist/dat00\\_eu.htm](https://www.federalreserve.gov/releases/h10/hist/dat00_eu.htm); BLS, "CPI Inflation Calculator," available at [https://www.bls.gov/data/inflation\\_calculator.htm](https://www.bls.gov/data/inflation_calculator.htm); BLS, "Databases, Tables & Calculators by Subject," available at <https://data.bls.gov/timeseries/CUUR0000SA0>.

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45. These findings and academic papers demonstrate a qualitative consideration underlying my analysis: consumers value their privacy and the amount by which they value their privacy can be quantified. I address specific market measures applicable for this matter in **Section V**.

### III. ANALYSIS FRAMEWORK

46. I understand from counsel that discovery is ongoing and that, to date, Defendants have produced limited damages-related discovery sought by Plaintiffs. In particular, Plaintiffs have requested documents relating to Defendants' revenue, expenses, and profits, both in general and as they relate to the TikTok Pixel and Events API.

47. My work in the case is thus ongoing. I reserve the right to update, amend, modify, or supplement my analysis as appropriate if new or additional information becomes available to me.

48. I understand from counsel that the monetary relief available for the alleged wrongful conduct specified in Plaintiffs' Second Amended Complaint includes TikTok's unjust enrichment (also referred to as non-restitutionary disgorgement), Plaintiffs' actual damages (including restitution), and statutory damages. I further understand from counsel that punitive damages, nominal damages, and injunctive relief are also available for the alleged wrongful conduct. Based on this understanding, I lay out below the methodologies by which I can measure class-wide recovery, or economic remedies, for Class Members at this stage of the litigation. The three methodologies by which I can calculate class-wide recovery consist of the following.

49. First, given Plaintiffs' claim that Defendants were, and continue to be, unjustly enriched from their unauthorized collection and/or use of Class Members' data, I lay out a methodology for calculating disgorgement of Defendants' profits on a class-wide basis. I understand from counsel that in seeking unjust enrichment, Plaintiffs may present evidence of the total or gross amount of the benefit that Defendants derived from the alleged misconduct, or a reasonable approximation of that amount. Subsequently, Defendants may present evidence of any allowable deductions to sales (such as returns, credits, and expenses) to show the profits the Defendant(s) gained. Further, the Defendant(s) may also

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present demonstrable evidence of apportionment of profits related to factors other than the alleged wrongdoing. Based on that understanding, I lay out two different scenarios for calculating unjust enrichment. See **Section IV**.

50. Second, I lay out a methodology for calculating restitutionary damages for each Class Member by quantifying the economic value of (1) privacy and (2) personal data that are collected by the TikTok Pixel and Events API. In doing so, I analyze various market measures and evidence on consumer preferences, including market datapoints reflecting third parties' willingness to pay for online consumer data, studies on the value that consumers themselves place on data privacy, and consumers' payments to reduce or block unauthorized access to their personal data. See **Section V**.
51. Finally, I explain the methodology for calculating statutory damages pursuant to ECPA and CIPA. See **Section VI**.

#### **IV. UNJUST ENRICHMENT**

52. As described above, Plaintiffs allege that Defendants were unjustly enriched as a result of the alleged unauthorized data collection through the TikTok SDK. The remedy of unjust enrichment involves disgorgement of the revenue and related profits Defendants derived from the personal data they improperly collected from Class Members. In particular, I seek to identify the advertising revenue attributable to allegations Plaintiffs are making with respect to the TikTok Pixel and Events API. I understand it is Plaintiffs' burden to calculate the total or gross amount of the benefit, or a reasonable approximation thereof (i.e., revenues), and the burden then shifts to Defendants to present costs, expenses, or deductions to determine the net benefit (i.e., profit).<sup>47</sup> Furthermore, discovery is ongoing, and has not yet revealed reliable evidence to allow me to quantify TikTok's costs for the TikTok Pixel or Events API.
53. In **Section II.D.1** I established the reasonableness of advertisers preferring more personal information to less to improve their advertising. In turn, companies like Defendants that

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<sup>47</sup> See *Brown v. Google, LLC*, 2022 WL 17961497, at \*6 (Dec. 12, 2022).

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make money primarily through advertising have a profit incentive to collect and monetize the personal information that they collect. **Section IV.A** presents the scenario where Defendants have admitted how they use Class Members' data yet have thus far failed to provide evidence on how such uses should be valued. **Section IV.B** describes the calculation of relevant revenues Defendants have earned related to the technology at issue in this matter.

#### **IV.A. Scenario One: Unjust Enrichment Can Be Calculated Using TikTok’s Own Documents Regarding the Value That It Derives from Using Non-TikTok User Data**

54.

<sup>48</sup> Defendants' Amended Responses and Objections to Plaintiffs' Second Set of Interrogatories (Nos. 3–14), Apr. 16, 2024, pp. 57–59.

49 *Id.*

<sup>50</sup> *Id.* See also Deposition of Lizzie Li, June 5, 2024, p. 278. See, e.g., Deposition of Lizzie Li, June 5, 2024, p. 179.

<sup>51</sup> Defendants' Amended Responses and Objections to Plaintiffs' Second Set of Interrogatories (Nos. 3–14), Apr. 16, 2024, pp. 57–59. See also Deposition of Daniel Kirchgessner, Apr. 17, 2024, pp. 90–92.

<sup>52</sup> Defendants' Amended Responses and Objections to Plaintiffs' Second Set of Interrogatories (Nos. 3–14), Apr. 16, 2024, pp. 57–59; Deposition of Daniel Kirchgessner, Apr. 17, 2024, pp. 92–98.

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Term	Percentage (%)
Climate change	95
Global warming	88
Green energy	92
Sustainable development	90
Carbon footprint	85
Renewable energy	82
Environmental protection	93

57. It is reasonable to conclude [REDACTED] [REDACTED] that there is economic value to their collection of Class Member data. It is my understanding from counsel that Plaintiffs are currently in the process of seeking discovery on Defendants' internal documents that may quantify or permit me to quantify the economic value Defendants derive from the collection and/or use of Class Member data. I expect discovery will provide a uniform way to calculate disgorgement on a class-wide basis related to TikTok's unjust enrichment.

#### **IV.B. Scenario Two: Unjust Enrichment Can Be Assessed by Analyzing the Value of the Pixel and Events API to Defendants**

58. I can calculate Defendants' unjust enrichment by assessing the functionally requisite economic value of the Pixel and Events API to Defendants.

53 [REDACTED] (TIKTOK-BG-000002930–  
940 at 934–935).

54 [REDACTED] (TIKTOK-BG-000002930–940 at 938).

55 [REDACTED] (TIKTOK-BG-000002930–  
940 at 932).

56 *Id.*

57 *Id.*

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59. As of the date of this declaration, I have not received Defendants' financial data or advertising revenue.<sup>59</sup> [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] I first provide an estimate related to the TikTok Pixel (**Section IV.B.1**), then the Events API (**Section IV.B.2**), and then discuss how to take these revenues to arrive at Defendants' unjust enrichment related to Class Members' allegations (**Section IV.B.3**).

**IV.B.1. TikTok Pixel Revenue**

60. [REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>58</sup> Deposition of Lizzie Li, June 5, 2024, pp. 214–215.

<sup>59</sup> I understand from counsel this financial information has been requested and discovery is ongoing.

<sup>60</sup> See, e.g., TIKTOK-BG-000125306–381; [REDACTED]  
[REDACTED] (TIKTOK-BG-000003172–192 at 173).

<sup>61</sup> [REDACTED] (TIKTOK-BG-000125306–381 at 349).  
[REDACTED]

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61.

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(TIKTOK-BG-000125306–381 at 310, 325, and 345–346).

62 [REDACTED] (TIKTOK-BG-000003014 at 3016).

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62.

[REDACTED]

63.

[REDACTED]

[REDACTED]

---

63

[REDACTED] (TIKTOK-BG-000003014 at 3016) (emphasis removed).

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[REDACTED]

[REDACTED]

64. [REDACTED]  
[REDACTED]  
[REDACTED] [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

65. [REDACTED]  
[REDACTED]

---

<sup>64</sup> See ¶ 67, *infra*.

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Term	Percentage
GMOs	~95%
Organic	~95%
Natural	~95%
Artificial	~85%
Organic	~95%
Natural	~95%
Artificial	~85%
Organic	~95%
Natural	~95%
Artificial	~85%

66. [REDACTED]

[REDACTED]

[REDACTED]

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67.

65

66 [REDACTED] (TIKTOK-BG-000125693-753)

[REDACTED] (TIKTOK-BG-000002716-742 at 734) *TikTok and ByteDance v. Merrick Garland*.

Case No. 24-1113, Petition for Review of Constitutionality of the Protecting Americans from Foreign Adversary Controlled Applications Act, May, 7, 2024, p. 2 (noting 170 million users in the U.S.).

67 Deposition of Branyk Shao, June 7, 2024, pp. 28, 33-34, and 36-41.

<sup>68</sup> TIKTOK-BG-000157229-238 at 230; Deposition of Lizzie Li, June 5, 2024, pp. 75-76.

(TIKTOK-BG-000003014 at 3016).

<sup>70</sup> Deposition of Lizzie Li, June 5, 2024, pp. 40–41 and 59–60.

71 DEPOSITION OF ELLIE LI, JUNE 3, 2021, pp. 70-71 and 99

(TIKTOK-BG-000003014 at 3016).

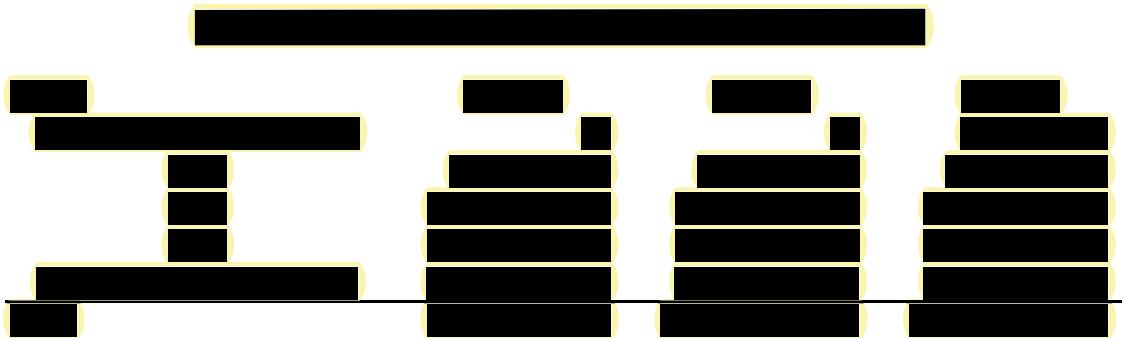
Should additional data or information be provided, I will update my opinion as appropriate.

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68.

69. The following table shows the year-by-year total of TikTok Pixel revenues for Models 1-3.

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70. I assume that the TikTok Pixel revenue values I utilize for Models 1–3 are worldwide. I thus take an allocation to arrive at the share of U.S. revenue attributable to the TikTok Pixel (TikTok has not yet provided data to allocate its overall TikTok Pixel revenues to the U.S. only). TikTok reported in 2024 that it had “revenue of about \$16 billion [in 2023] in the United States,” while ByteDance had revenue of \$120 billion in 2023.<sup>73</sup> This suggests at that time that U.S. TikTok revenue was 13 percent of total Defendants’ revenue.<sup>74</sup> I understand that ByteDance has other apps separate from TikTok (e.g., Pangle),<sup>75</sup> which suggests this percentage is understated when attempting to adjust the global TikTok Pixel revenues down to U.S. TikTok Pixel revenues. If I subsequently receive additional data indicating that the percentage of U.S. revenues is determined to be higher or lower, I reserve the right to update this number accordingly.

71. The following table makes the adjustment of 13 percent to obtain U.S. revenues from the overall TikTok revenues identified above.

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72

<sup>73</sup> TikTok reported annual U.S. revenue of \$16 billion for 2023, representing 13 percent of ByteDance’s \$120 billion reported global revenue over the same period. Reuters, “TikTok’s US revenue hits \$16 bln as Washington threatens ban, FT reports,” Mar 15, 2024, available at <https://www.reuters.com/technology/tiktoks-us-revenue-hits-16-bln-washington-threatens-ban-ft-reports-2024-03-15/>; FT Reporters, “TikTok’s US revenues hit \$16bn as Washington threatens ban,” Financial Times, Mar. 15, 2024, available at <https://www.ft.com/content/275bd036-8bc2-4308-a5c9-d288325b91a9>.

<sup>74</sup>  $\$16 \div \$120 = 13\%$ .

<sup>75</sup> For example, I understand Pangle is the ad network of TikTok for Business and is a ByteDance company. Pangle, “Ad Network of TikTok for Business,” accessed June 19, 2024, <https://www.pangleglobal.com/>.

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72. Models 1–3 demonstrate the steps involved in the methodology I would use to compute TikTok's Pixel revenue relevant for the allegations in this matter. [REDACTED]

73. My analysis above has calculations of revenues that start July 1, 2020. However, I understand the Class Period starts March 2022. The figures below adjust the start date to determine unjust enrichment.

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[REDACTED]

ATTORNEY EYES' ONLY

74. Should counsel inform me that the Class Period should be changed in some fashion, the methodology I have laid out will be consistent and can be applied to any Class Period start or end date.

**IV.B.2. Events API Revenue**

75. Similar to my analysis of the TikTok Pixel revenue in the prior section, I can model Events API revenue based on Defendants' data and documents.

76. [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

77. [REDACTED]  
[REDACTED]

I understand that, to date, TikTok has not yet produced the underlying data that created either of these charts, or any subsequent data on the Events API similar to these charts.

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76 [REDACTED] (TIKTOK-BG-000003172-192 at 173).  
77 [REDACTED] (TIKTOK-BG-000005364-392 at 366).

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78.

78

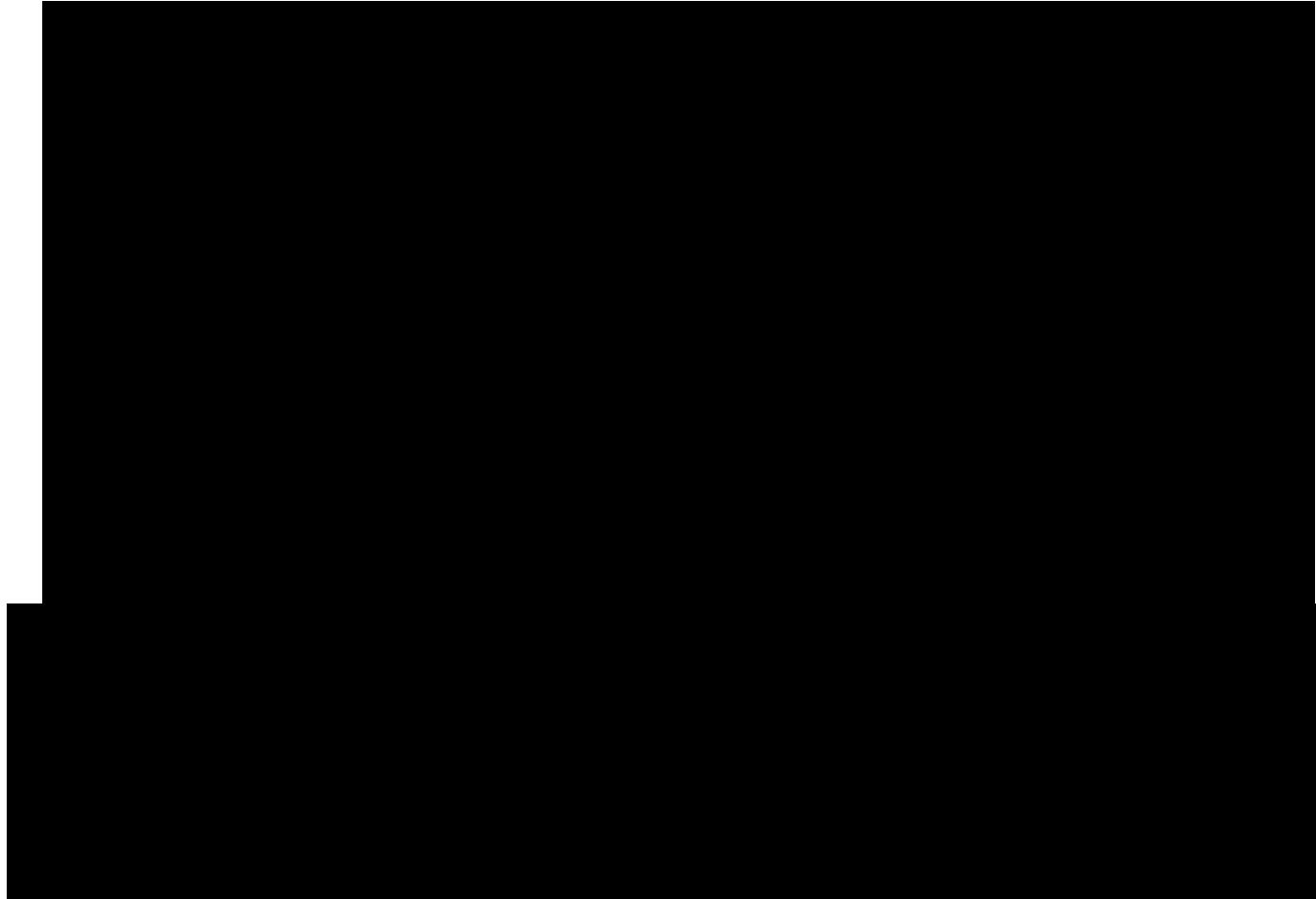
79

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80 [REDACTED] (TIKTOK-BG-000003172–192 at 180).  
[REDACTED] (TIKTOK-BG-000005364–392 at 366).

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80. The following table shows the year-by-year total of TikTok Events API global revenues for Model Events API and makes the same adjustment as for the TikTok Pixel to get to U.S. revenue ( $\times 13$  percent).

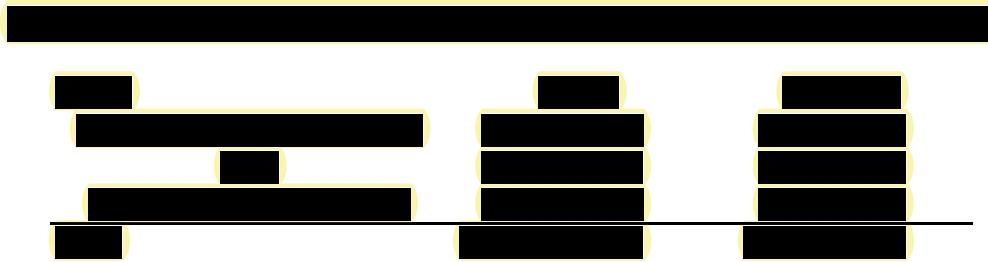
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<sup>81</sup> Just as for my analysis for the TikTok Pixel, I utilize June 21, 2024, throughout this declaration as my end date, as it is the date on which I am submitting these opinions. However, I understand that Events API continues to collect Class Member data every day and thus recovery from Defendants' alleged misconduct will continue to accrue beyond June 21, 2024. I reserve the right to update my analysis to account for alternative end dates.

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81. I provide the same information, limited to the Class Period below.

ATTORNEY EYES' ONLY



82. Should TikTok provide the underlying revenues data relevant for this analysis, I will update my analysis accordingly.
83. Should counsel inform me that the Class Period should be changed in some fashion, the methodology I have laid out will be consistent and can be applied to any Class Period start or end date.

**IV.B.3. Summary of TikTok's Unjust Enrichment Related to Scenario 2**

84. In the prior two subsections I have laid out the methodology and calculations of the revenues I understand are at issue in this matter and that are causally linked to TikTok's unjust enrichment. As mentioned above, if Defendants subsequently claim to have identified and substantiated appropriate deductions from revenue and/or apportionment of profit to factors other than the alleged wrongdoing, I will consider those claims and respond appropriately.

**V. RESTITUTIONARY DAMAGES**

85. As an alternative to the unjust enrichment remedy, I have considered actual, or restitutionary, damages to Class Members resulting from the alleged wrongful conduct since the start of the Class Period. As described below, such actual (or restitutionary) damages can be determined as a form of payments necessary to compensate for the market value of the information allegedly wrongfully collected from Class Members. I have identified various market measures of the economic market value of privacy and the economic value of personal information (i.e., market measures of values exchanged between buyers and sellers of personal information similar to that collected by the TikTok Pixel and Events API).

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86. The first of these market measures includes the fees that corporations like AT&T and Meta have charged customers in exchange for *not* collecting personal data. The value of personal information is apparent from the fact that companies are willing to charge premiums from their customers when that company is unable to utilize personal information to support its advertising revenues. These companies make a direct translation between the lack of advertising revenue they will receive as a result of failing to capture personal information and a premium in fees. In return, these customers also get to decide if the additional cost is worth the added insulation of their personal information and increase in their online privacy. See **Section V.A.**
87. The second market measure analysis consists of payments that corporations like Google and Ipsos, Nielsen, and SavvyConnect have paid to individuals to track their online activity. The value of personal information is apparent from the fact that companies pay users for the collection of their online data. The willingness of these companies to provide direct payment to individuals demonstrates the monetary value companies place on collecting and understanding online behavior and personal data. There are multiple examples of research companies that pay users to download software that collects data on the users' online activity. See **Section V.B.**
88. Next, I use these market measures to determine the economic value of Class Member's data on a per month basis. I show that the appropriate restitutive damage methodology is consistent across Class Members. See **Section V.C.**
89. I understand that Defendants have stated that they will produce, but have yet to produce, documents responsive to certain document requests propounded by Plaintiffs on the monetary value that Defendants themselves place on the type of data collected by the TikTok SDK.<sup>82</sup> I reserve the right to update, modify, and/or supplement my analyses and opinions as appropriate after Defendants have produced the documents at issue.

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<sup>82</sup> In particular, I understand from counsel that the parties are currently negotiating the scope of documents to be produced responsive to RFP Nos. 95, and 96, which sought, as written: "All Documents relating to Defendants' studies or programs in which participants have received payment or other things of value in exchange for their data, information, monitoring, or participation," and "Copies of all surveys, studies, and reports that Defendants have conducted or

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**V.A. Companies Charge Premiums for Products When Collection and/or Use of User Data is Restricted**

90. Some companies that historically obtained user data have considered alternate pricing using a premium for their products and services where the collection and/or use of consumer data is restricted. The increased price can reflect an increase in the cost of business due to a limitation on data collected or extent of its use, as well as a premium consumers place on any actual or perceived privacy enhancement or user experience. Regardless, companies have signaled that limiting their collection and/or use of consumer data could be available in exchange for increased payment received, further indicating value associated with data itself.

**V.A.1. AT&T and “GigaPower”**

91. AT&T differentiated pricing for its customers in Austin, Texas by launching “GigaPower” internet service in 2013. The price was \$70 per month if AT&T and its partners provided targeted ads to its customers, and the price was \$99 per month if there were no targeted ads.<sup>83</sup> If a customer selected the \$70 option and opted in to targeted ads, then it was reported that AT&T also “collect[ed] data regardless of a Web browser’s privacy settings for cookies, do-not-track, and private browsing.”<sup>84</sup>

92. This differential of \$29 per month (in the per-month service fee) thus demonstrates the value that AT&T is willing to forgo to serve targeted ads.<sup>85</sup> I understand the program was

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commissioned to understand TikTok Users and/or non-TikTok Users, including summaries, analyses, correspondence, and other Documents relating to such surveys, studies, and reports,” respectively.

<sup>83</sup> Jon Brodkin, “AT&T offers gigabit Internet discount in exchange for your Web history,” Ars Technica, Dec. 11, 2013, <https://arstechnica.com/information-technology/2013/12/att-offers-gigabit-internet-discount-in-exchange-for-your-web-history/>; Natasha Singer, “AT&T’s Offer: Share Your Data for Personalized Ads, or Pay More,” *New York Times*, Feb. 18, 2015, <https://archive.nytimes.com/bits.blogs.nytimes.com/2015/02/18/atts-offer-share-your-data-for-personalized-ads-or-pay-more/>; David Auerbach, “Privacy Is Becoming a Premium Service,” *Slate*, Mar. 31, 2015, <https://slate.com/technology/2015/03/at-t-gigapower-the-company-wants-you-to-pay-it-not-to-sell-your-data.html>.

<sup>84</sup> Jon Brodkin, “AT&T to end targeted ads program, give all users lowest available price,” Ars Technica, Sept. 30, 2016, <https://arstechnica.com/information-technology/2016/09/att-to-end-targeted-ads-program-give-all-users-lowest-available-price/>.

AT&T apparently did “not collect information from secure (<https://>) or otherwise encrypted sites.” Stacey Higginbotham, “AT&T’s GigaPower plans turn privacy into a luxury that few would choose,” *Yahoo! Finance*, May 13, 2014, <https://finance.yahoo.com/news/t-gigapower-plans-turn-privacy-203513501.html>.

<sup>85</sup> Jon Brodkin, “AT&T offers gigabit Internet discount in exchange for your Web history,” Ars Technica, Dec. 11, 2013, <https://arstechnica.com/information-technology/2013/12/att-offers-gigabit-internet-discount-in-exchange-for-your-web-history/>.

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ultimately discontinued in 2016—but that indicates AT&T charged, and a customer may have spent, almost an additional \$1,000 in service fees alone to avoid targeted ads, just from AT&T and its partners, over 34 months.<sup>86</sup> Apparently up to “three-fourths” of customers opted for the less expensive “tracking” plan while it was offered, and in doing so received compensation in the form of the subscription-fee discount.<sup>87</sup>

#### V.A.2. Meta’s “Pay or Okay” Monetization Approach in Europe

93. In Europe, consumer privacy is regulated under the General Data Protection Regulation (“GDPR”), which requires companies to have a legal basis for processing consumer data. Ultimately, Europe requires that users opt in or out with explicit consent for sharing personal information with a website or app. As a result of such requirements, companies have reacted in a number ways. One such approach taken by Meta is a program called “pay or okay.”
94. Under this program, Meta charges a fee to Facebook and Instagram users who do not wish to be tracked. Indeed, Meta’s “pay or okay” system requires Facebook and Instagram users “to either pay a ‘privacy fee’ of” approximately \$270 “per year or agree to be tracked.”<sup>88</sup> In addition, Meta’s fee is not based on prior user behavior, the amount of time spent on the apps, or tied to other activity on Meta’s apps, but instead static across users.
95. The \$270 fee also frees consumers from tracking carried out only by Facebook and Instagram, not other companies. Apparently “30% of the top 100 websites in Germany are already using ‘Pay or Okay.’”<sup>89</sup> This trend is so pervasive that, by one estimate, a “family of

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<sup>86</sup> history/; Stacey Higginbotham, “AT&T’s GigaPower plans turn privacy into a luxury that few would choose,” Yahoo! Finance, May 13, 2014, <https://finance.yahoo.com/news/t-gigapower-plans-turn-privacy-203513501.html>.

<sup>87</sup> \$29 per month × 34 months = \$986.

<sup>88</sup> Stacey Higginbotham, “AT&T’s GigaPower plans turn privacy into a luxury that few would choose,” Yahoo! Finance, May 13, 2014, <https://finance.yahoo.com/news/t-gigapower-plans-turn-privacy-203513501.html>.

<sup>89</sup> NOYB, “28 NGOs urge EU DPAs to reject ‘Pay or Okay’ on Meta,” Feb. 16, 2024, <https://noyb.eu/en/28-ngos-urge-eu-dpas-reject-pay-or-okay-meta>. *See also* Léa Roubinet, “Pay or Okay – The Move to Paid Subscriptions on Social Networks,” Tech Policy, Feb. 6, 2024, available at <https://www.techpolicy.press/pay-or-okay-the-move-to-paid-subscriptions-on-social-networks/>; Meta, “Facebook and Instagram to Offer Subscription for No Ads in Europe,” press release, Oct. 30, 2023, available at <https://about.fb.com/news/2023/10/facebook-and-instagram-to-offer-subscription-for-no-ads-in-europe/>; Eric Benjamin Seufert, “What is an ‘appropriate fee’ for a social media subscription,” Mobile Dev Memo, Dec. 1, 2023, available at <https://mobiledevmemo.com/what-is-an-appropriate-fee-for-a-social-media-subscription/>.

The amount listed in the article was €251.88. At an exchange rate of \$1.07 to €1, this equals \$269.51.

<sup>90</sup> NOYB, “‘Pay or Okay’: 1,500 € a year for your online privacy?” Mar. 19, 2024, <https://noyb.eu/en/pay-or-okay-1500-a-year-for-your-online-privacy>.

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four with just 35 apps per phone would end up with a bill of" approximately \$37,700 per year.<sup>90</sup>

96. Importantly, Meta's privacy fee represents the monetary amount associated with the data it collects per user per year. By charging this fee, Meta acknowledges that it otherwise is collecting something of value (i.e., individuals' data) from its users.
97. These two examples from AT&T and Meta demonstrate the tremendous value companies place on collecting personal information from their customers. Both have monthly fees of similar magnitudes, the charged premium is uniform between customers, and users in the marketplace can accept the higher prices for protecting their information, or choose to save money for the collection of their data. These two market measures demonstrate examples of methods and metrics for modeling actual damages non-TikTok users face based on TikTok's collection of personal information through the TikTok Pixel and Events API.

## **V.B. Companies Place a Market Value on Collection of User Data**

98. This section provides examples of certain companies other than TikTok that place a market value on user's data. Each example shows market values that do not vary based on the underlying characteristics of a particular user, though some of the measures vary based on the variety of tracking systems utilized (e.g., capturing information beyond online browsing related data, such as data from mobile device usage and TV viewership).

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<sup>90</sup> eu-year-your-online-privacy; NOYB, "28 NGOs urge EU DPAs to reject 'Pay or Okay' on Meta," Feb. 16, 2024, <https://noyb.eu/en/28-ngos-urge-eu-dpas-reject-pay-or-okay-meta>.

<sup>90</sup> NOYB, "28 NGOs urge EU DPAs to reject 'Pay or Okay' on Meta," Feb. 16, 2024, <https://noyb.eu/en/28-ngos-urge-eu-dpas-reject-pay-or-okay-meta>. See also Léa Roubinet, "'Pay or Okay' – The Move to Paid Subscriptions on Social Networks," Tech Policy, Feb. 6, 2024, available at <https://www.techpolicy.press/pay-or-okay-the-move-to-paid-subscriptions-on-social-networks/>; Meta, "Facebook and Instagram to Offer Subscription for No Ads in Europe," press release, Oct. 30, 2023, available at <https://about.fb.com/news/2023/10/facebook-and-instagram-to-offer-subscription-for-no-ads-in-europe/>; Eric Benjamin Seufert, "What is an 'appropriate fee' for a social media subscription," Mobile Dev Memo, Dec. 1, 2023, available at <https://mobiledevmemo.com/what-is-an-appropriate-fee-for-a-social-media-subscription/>.

The amount listed in the article was €35,263.20. At an exchange rate of \$1.07 to €1, this equals \$37,731.62.

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**V.B.1. Ipsos Screenwise and Google**

99. Ipsos is a market research and survey company that Google has historically used for consumer research by collecting personal information from users through tracking tools.<sup>91</sup> Members of the Ipsos Screenwise panel are paid to have their online, electronic, and other activity tracked. This information allows Google to better understand how users interact with its own products.<sup>92</sup> Members of this panel can request their data to be deleted and yet, Google still generates value from such data. For instance, Google “may aggregate, anonymize, or otherwise de-identify any personal information instead of deleting it,” and even when no longer part of the panel, Google “may continue to store, use, and share the information previously obtained.”<sup>93</sup>

100. Although publicly available information from Ipsos on payments and rewards for members of the Screenwise panel are limited and have changed over time, all data points indicate that (1) participants are paid in exchange for allowing Google to access their browsing data and (2) the amounts paid for the browsing data are uniform across users. According to a 2012 image on Google’s webpage explaining Screenwise, users would receive \$5 Amazon gift cards every three months in exchange for installing the browser extension.<sup>94</sup> Another article from 2012 reports that household members received \$100 simply for signing up and then \$20 per month by installing additional software and hardware.<sup>95</sup> Information relating to the Screenwise program payments describe a similar reward structure (with increased reward values continuing in more recent years).<sup>96</sup> For example, in September 2020, a Reddit user

<sup>91</sup> Ipsos, “Ipsos Screenwise Panel Cookie Policy,” Ipsos, June 25, 2021, <https://screenwisepanel.com/cookie-policy>; Ipsos, “About the Ipsos Screenwise Panel,” Ipsos, accessed Mar. 7, 2024, <https://screenwisepanel.com/home>; Dante D’Orazio, “Google Screenwise pays opt-in users for expanded web tracking,” The Verge, Feb. 8, 2012, <https://www.theverge.com/2012/2/8/2785751/google-screenwise-panel-web-monitoring-knowledge-networks>; Casey Johnston, “Google paying users to track 100% of their Web usage via little black box,” Ars Technica, Feb. 8, 2012, <https://arstechnica.com/gadgets/2012/02/google-paying-users-to-track-100-of-their-web-usage-via-little-black-box/>.

<sup>92</sup> Ipsos, “Google Panel Privacy Policy,” Ipsos, Dec. 28, 2022, <https://screenwisepanel.com/google-panel-privacy-policy>.

<sup>93</sup> Ipsos, “Google Panel Privacy Policy,” Ipsos, Dec. 28, 2022, <https://screenwisepanel.com/google-panel-privacy-policy>.

<sup>94</sup> Google, “Help Us Make Google Better,” Feb. 10, 2012, image from internet archive, *available at* <https://web.archive.org/web/20120210041154/http://www.google.com/landing/screenwisepanel/>; *see also* Dante D’Orazio, “Google Screenwise pays opt-in users for expanded web tracking,” The Verge, Feb. 8, 2012, <https://www.theverge.com/2012/2/8/2785751/google-screenwise-panel-web-monitoring-knowledge-networks> (\$5 for every three months of tracking).

<sup>95</sup> Dante D’Orazio, “Google Screenwise pays opt-in users for expanded web tracking,” The Verge, Feb. 8, 2012, <https://www.theverge.com/2012/2/8/2785751/google-screenwise-panel-web-monitoring-knowledge-networks>.

<sup>96</sup> See n.43 and n.44, *supra*.

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posted information on the categories of weekly rewards a panelist could receive at that point in time. The weekly reward for allowing Ipsos to track browser activity was \$1 per week (or \$4.33 per month).<sup>97</sup> There are also separate incremental rewards for allowing Screenwise to collect information from a router, cell phone, tablet, or TV.<sup>98</sup> These 2020 figures are consistent with a Screenwise panel rewards summary listed on an August 2020 review from the personal money making and saving website LushDollar.com.<sup>99</sup>

101. In addition, an undated screenshot produced in another action confirms the amounts and devices information collected from the Screenwise program. For example, the following screenshot in **Figure 16** from Ipsos demonstrates the same reward and payment structures for each participant in the program:

**Figure 16: Summary of Rewards and Payments from Ipsos Screenwise<sup>100</sup>**

If you complete this survey and qualify for the Ipsos Screenwise Panel, you will receive a \$20 reward. You will also receive up to \$100 after installing the router and up to \$16 in monthly rewards for your participation.

How you can earn monthly rewards:

- Router: \$5 for having all Wi-Fi devices connected to the Screenwise Router
- Browser: \$3 for using browsers with the Screenwise Meter browser extension
- Mobile phone: \$3 for using phones with the Screenwise Meter app installed
- Tablet: \$3 for using tablets with the Screenwise Meter app installed
- \$2 bonus reward for using 3 of the 4 of the devices above

Participating with all of your household devices gives us a better understanding of how people use the internet and mobile apps—and it's the best way to earn the most rewards available.

102. In 2023, it was reported that the Screenwise Panel was at that time paying \$2 per week (or \$8.67 per month) for tracking through a browser extension and mobile meter.<sup>101</sup>

<sup>97</sup> With 52 weeks in a year and 12 months in a year, \$1 per week equals \$4.33 per month.

<sup>98</sup> cobaltorange, “Does anyone still do Screenwise Panel?” Reddit, Sept. 20, 2020, [https://www.reddit.com/r/beermoney/comments/iwijxm/does\\_anyone\\_still\\_do\\_screenwise\\_panel/?rdt=38358](https://www.reddit.com/r/beermoney/comments/iwijxm/does_anyone_still_do_screenwise_panel/?rdt=38358).

<sup>99</sup> Tom Nathaniel, “Screenwise Meter Panel Review: Money for Nothing?” LushDollar.com, Aug. 12, 2020, <https://lushdollar.com/the-screenwise-meter-panel/>.

<sup>100</sup> *Rodriguez et al., v. Google LLC*, Case No. 3:20-cv-04688-RS (DI 364, Exhibit 23), Expert Report of Michael J. Lasinski, Feb. 20, 2023, p. 51. The Lasinski report does not indicate when these payments were in place.

<sup>101</sup> The Penny Hoarder, “How to Make \$345/Year By Installing These 3 Apps,” Sept. 11, 2023, accessed Mar. 1, 2024,

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103. The evidence with respect to Screenwise demonstrates a single monthly amount is given to the program participants when their personal information is collected through internet browsing.

**V.B.2. Nielsen**

104. Another example is Nielsen, a professional research company and “the world’s leading provider of media and marketing information” that funds a panel for computer and mobile data.<sup>102</sup> In 2023, the panel offered up to \$50 per year to its participants.<sup>103</sup> In 2024, the panel now offers up to \$60 a year for installing its tracking app on a mobile device and enters its participants into a \$500 monthly sweepstakes for installing tracking software on participants’ computers.<sup>104</sup> Registering for the panel may involve providing personal identifying information, including name, address, email and other personal, demographic information and unique identifiers as well as behavior or preference data. The software collects data on website activity, online services, device information including IP address, location information, and files received, uploaded, or downloaded.<sup>105</sup>

105. The benefit to individuals of releasing their personal information to this company is for a fixed monthly amount that does not vary between participants. The data collected by Nielsen appear to overlap with that collected by TikTok through the TikTok Pixel and Events API.

**V.B.3. SavvyConnect**

106. SavvyConnect, a desktop application launched in 2009 by SurveySavvy, is an online survey platform to conduct behavioral market research while users browse the internet.<sup>106</sup> SavvyConnect currently pays \$3 per device per month to install and activate the software on

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<sup>102</sup> <https://www.thepennyhoarder.com/make-money/how-to-make-295/year-by-installing-these-2-apps/>.

<sup>103</sup> Nielsen, “About Us,” accessed Mar. 7, 2024, <https://computermobilepanel.nielsen.com/ui/US/en/sdp/landing>.

<sup>104</sup> R.J. Weiss, “Nielsen Computer and Mobile Panel Review,” The Ways To Wealth, accessed Mar. 4, 2024, <https://www.thewaystowealth.com/reviews/nielsen-computer-and-mobile-panel-review/>.

<sup>105</sup> Nielsen, “Computer & Mobile Panel,” accessed Mar. 7, 2024, <https://computermobilepanel.nielsen.com/ui/US/en/sdp/landing>.

<sup>106</sup> Nielsen U.S. Panel Privacy Notice Summary,” accessed June 20, 2024, <https://computermobilepanel.nielsen.com/ui/US/en/privacypolicyen.html>.

<sup>107</sup> SurveySavvy, “How it Works,” accessed Mar. 7, 2024, [https://www.surveysavvy.com/how\\_it\\_works](https://www.surveysavvy.com/how_it_works).

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a computer, phone, or tablet to collect data from users' devices while browsing the web.<sup>107</sup> This amount is down from the \$5 monthly amount per device offered in 2020 and through around December 2023.<sup>108</sup> The minimum requirement for receiving payment is active online usage 7 days in a month.<sup>109</sup> Below is an example from the SavvyConnect webpage describing what information is shared and how a user makes money.

**GET MORE FROM EVERY DEVICE**  
Install SavvyConnect on a computer or mobile device to earn \$3 USD  
for each type of device per month. [Learn More »](#)

## It's Easy!



YOU BROWSE THE WEB

Download SavvyConnect on your smartphone, tablet and/or PC and participate in market research simply by surfing the web. Setting it up takes less than two minutes.



YOU EARN MONEY

Receive monthly cash rewards as you surf the web. And as a SavvyConnect member, you also receive additional research opportunities that pay higher rewards.



YOUR DATA IS SECURE

Enjoy a safe, secure experience knowing that your data is protected and your personal information is never shared. Read more about our [Privacy Policy](#) and [Terms & Conditions](#).

107. Some key economic factors with SavvyConnect include the following: The program pays the \$3 monthly price for each type of device. The setup time is advertised as being quite low, at two minutes. All participants have to do is “surf the web” to “receive monthly cash rewards.” Participants can also receive “additional research opportunities that pay higher

<sup>107</sup> SurveySavvy, “What is SavvyConnect?” accessed June 13, 2024, <https://www.surveysavvy.com/savvyconnect>.

<sup>108</sup> SurveySavvy, “What is SavvyConnect?” May 13, 2020, image, available at <https://web.archive.org/web/20200513143219/https://surveysavvy.com/savvyconnect/>; SurveySavvy, “What is SavvyConnect?” June 5, 2023, image, available at <https://web.archive.org/web/20230605223803/https://surveysavvy.com/savvyconnect/>; SurveySavvy, “What is SavvyConnect?” Dec. 1, 2023, image, available at <https://web.archive.org/web/20231201102936/https://surveysavvy.com/savvyconnect/>.

<sup>109</sup> SurveySavvy, “SavvyConnect Monthly Participation Requirements” accessed Mar. 7, 2024, <https://surveysavvy.com/savvyconnect-requirements/>.

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rewards.”<sup>110</sup> SavvyConnect also states that a participants “personal information is never shared.”<sup>111</sup>

108. SavvyConnect is collecting browsing information from users and those users receive a uniform amount each month for allowing SavvyConnect to collect their browsing information.

**V.C. Summary of Market Measures and Finding of the Economic Value of a Class Member’s Data on a Per Class Member Per Month Basis**

109. For all the measures discussed above, the market values are uniform per user regardless of the total amount of data collected. This is true for both the price premiums charged to consumers when restricting the collection and/or use of their data as well as the prices paid to consumers in exchange for collecting data. The AT&T price premium example and Meta privacy fee in Europe involve market measures where companies charge users for *not* collecting and/or utilizing their data. Although these two real-world circumstances are informative, I find that the more relevant comparisons for the allegations in this matter are to focus on the market measures where companies affirmatively pay users for their data (i.e., Screenwise, Nielsen, and SavvyConnect).
110. Further evidence of the relevance of these market measures comes from consistency between the program vendors’ use and Defendants’ use of the data collected. For example, SavvyConnect explains that it rewards users for online data that it then uses to understand trends in online behavior, [REDACTED]  
[REDACTED]  
[REDACTED]
111. **Figure 17** includes a summary of the market measures discussed above and the amounts received by the program participants. The Screenwise, Nielsen, and SavvyConnect programs

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<sup>110</sup> SurveySavvy, “What is SavvyConnect?” accessed June 13, 2024, <https://www.surveysavvy.com/savvyconnect>; SurveySavvy, “How it Works,” accessed Mar. 7, 2024, [https://www.surveysavvy.com/how\\_it\\_works](https://www.surveysavvy.com/how_it_works).

<sup>111</sup> SurveySavvy, “What is SavvyConnect?” accessed June 13, 2024, <https://www.surveysavvy.com/savvyconnect>.

<sup>112</sup> [REDACTED]

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all provide payment to individuals in exchange for their browsing data. The Nielsen program and select Screenwise programs also include collection of device activity data (e.g., app usage, calling). The table below shows how the inclusion of device activity may impact the price program participants receive. Looking at the data collection programs, while the price level has changed over time, the uniform pricing structure has remained constant.

**Figure 17: Summary of Data Value Market Measures<sup>113</sup>**

Program	Year	Monthly Reward	Type of Data Collected
Screenwise	2020	\$4.33	Browsing data
	Unknown	\$3.00	Browsing data
	2023	\$8.67	Browsing data and device activity
Nielsen	2023	\$4.17	Browsing data and device activity
	2024	\$5.00	Browsing data and device activity
SavvyConnect	2020	\$5.00	Browsing data
	6/2023	\$5.00	Browsing data
	12/2023	\$3.00	Browsing data
	2024	\$3.00	Browsing data

112. These programs reflect the value of obtaining some, but not necessarily all, of a consumer's online data. The monthly payment is not a function of time spent online or number of pages visited. For example, SavvyConnect explains that to qualify for payment, the individual needs only to be active at least 7 days a month.<sup>114</sup> In addition, I understand participants in

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<sup>113</sup> The sources for these can be found in Sections V.B.1–V.B.3 but are repeated below. I only include values as of 2020. Not all rewards were listed as monthly amounts, instead using either weekly or annual time periods. The monthly equivalent amount was calculated for those rewards.

cobaltorange, "Does anyone still do Screenwise Panel?" Reddit, Sept. 20, 2020, [https://www.reddit.com/r/beamoney/comments/iwijxm/does\\_anyone\\_still\\_do\\_screenwise\\_panel/?rdt=38358](https://www.reddit.com/r/beamoney/comments/iwijxm/does_anyone_still_do_screenwise_panel/?rdt=38358); Tom Nathaniel, "Screenwise Meter Panel Review: Money for Nothing?" LushDollar.com, Aug. 12, 2020, <https://lushdollar.com/the-screenwise-meter-panel/>; Rodriguez et al., v. Google LLC, Case No. 3:20-cv-04688-RS (DI 364, Exhibit 23), Expert Report of Michael J. Lasinski, Feb. 20, 2023, p. 51; SurveySavvy, "What is SavvyConnect?" May 13, 2020, image, available at <https://web.archive.org/web/20200513143219/https://surveysavvy.com/savvyconnect/>; SurveySavvy, "What is SavvyConnect?" June 5, 2023, image, available at <https://web.archive.org/web/20230605223803/https://surveysavvy.com/savvyconnect/>; SurveySavvy, "What is SavvyConnect?" Dec. 1, 2023, image, available at <https://web.archive.org/web/20231201102936/https://surveysavvy.com/savvyconnect/>; SurveySavvy, "What is SavvyConnect?" accessed June 13, 2024, <https://www.surveysavvy.com/savvyconnect>; R.J. Weiss, "Nielsen Computer and Mobile Panel Review," The Ways To Wealth, accessed Mar. 4, 2024, <https://www.thewaystowealth.com/reviews/n Nielsen-computer-and-mobile-panel-review/>; Nielsen, "Computer & Mobile Panel," accessed Mar. 7, 2024, <https://computermobilepanel.nielsen.com/ui/US/en/sdp/landing>.

<sup>114</sup> Therefore, someone online for 7 days, 20 days, or 30 days would qualify for the same payment.

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the Screenwise panel and SavvyConnect may temporarily pause the data collection and not impact the payment received.<sup>115</sup>

113. The TikTok SDK, as alleged, collects browsing data.<sup>116</sup> [REDACTED] I understand website visitors do not have the option of blocking or disabling the TikTok Pixel from certain websites that they want to visit, the way users can turn off the Screenwise panel or SavvyConnect app. Given the consistency of the purpose of the TikTok SDK and the market measure programs, the fact that the market measures reflect collection of some but not necessarily all browsing data, and that users participate in the data collection programs of Screenwise and SavvyConnect, I conclude that the market value of the Class Member data collected by the TikTok SDK is most consistent and economically comparable with the SavvyConnect and Screenwise programs.

114. The steps and analysis I have laid out above describe the methodology I assess is appropriate in studying market measures relevant for Plaintiffs' allegations in this matter and the class member data that Defendants collect and/or use. I conclude, based on the information available at this stage of the case, that a \$3 monthly market measure for a website visitor's browsing data is appropriate as restitutionary damages to each Class Member. This market value aligns with the most recent SavvyConnect metric as well as the internal Screenwise value.

115. As an alternative and more conservative calculation, I also consider an additional metric where an allocation is applied to the monthly market measure. The market measure is a fixed payment amount per month for a user despite variation in the amount of data collected. In other words, Screenwise and SavvyConnect can collect data from any and all websites

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<sup>115</sup> For example, Ipsos notes “[p]anelists can use a non-metered device (or pause metering temporarily) when reading or entering personal information or using messaging services.” Ipsos, “Google Panel Privacy Policy,” Ipsos, Dec. 28, 2022, <https://screenwisepanel.com/google-panel-privacy-policy>. And from SavvyConnect, “Our PC/MCac software respects Private Browsing modes. While enabled, no data is collected from the current browsing session. However, please note that extensive use of the private browsing modes may affect your participation status within certain research studies.” SurveySavvy, “SavvyConnect FAQs,” accessed June 18, 2024, <https://surveysavvy.com/savvyconnect-faqs/>.

<sup>116</sup> Shafiq Declaration, Sections IV and V; Conversation with Dr. Shafiq.

<sup>117</sup> [REDACTED] (TIKTOK-BG-000003014 at 3033). See also Deposition of Lizzie Li, June 5, 2024, pp. 102–103.

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visited by a participant (assuming the meter is not turned off or an alternative browser is not used when browsing, for example, sensitive information). However, TikTok only has the TikTok Pixel and Events API on a share of all websites. Therefore, to account for one aspect of the potential footprint of Class Member data that could be collected by TikTok, an allocation may be applied based on the fraction of websites that have the TikTok SDK.

116. The approach I considered for the data market measure value allocation is based on placement of the Pixel and not subject to any individualized user treatment or analysis. This allocation is based on review of independent third-party studies regarding pixels, including the TikTok Pixel.
117. I have reviewed and considered studies performed by software privacy and security firms Feroot and LOKKER.<sup>118</sup> The Feroot report states that it “launched an investigation to ascertain the exact magnitude and pervasiveness of social media pixels/trackers collecting and transferring personal, sensitive, and private data using pixels or trackers.”<sup>119</sup> According to its April 2023 security report study on online pixels and trackers, Feroot concluded that the TikTok Pixel was present on 7.41 percent of websites studied. Feroot analyzed over 3,100 websites spanning a range of industries, including Financial Services & Banking, Healthcare, Technology and SaaS, e-Commerce, Airlines, and U.S. Federal and State Government.<sup>120</sup> The study included analysis of websites over the period of January and February 2023. Feroot also clarified that the presence of the TikTok Pixel had been growing.<sup>121</sup>
118. The LOKKER study, published in March 2024, performed a similar analysis and studied the presence of the TikTok Pixel. The focus of the LOKKER study is a “report offer[ing] a comprehensive analysis of web privacy risks across 3,419 websites in four main sectors: healthcare, technology, financial services, and retail, along with all websites of companies

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<sup>118</sup> Feroot, “Beware of Pixels & Trackers,” 2023 Feroot Client-Side Security Report, Apr. 5, 2023; LOKKER, “Website Privacy and Compliance Challenges: Quantifying Website Privacy Risks,” Mar. 2024, available at [https://lokker.com/wp-content/uploads/2024/04/LOKKER\\_Online-Data-Privacy-Report\\_032024-2.pdf](https://lokker.com/wp-content/uploads/2024/04/LOKKER_Online-Data-Privacy-Report_032024-2.pdf).

<sup>119</sup> Feroot, “Beware of Pixels & Trackers,” 2023 Feroot Client-Side Security Report, Apr. 5, 2023, p. 8.

<sup>120</sup> The study included examination of 3,675 organizations with unique websites, and 3,142 websites analyzed in depth including 108,836 unique webpages.

<sup>121</sup> Feroot, “Beware of Pixels & Trackers,” 2023 Feroot Client-Side Security Report, Apr. 5, 2023, p. 12.

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listed in the S&P 500 index.”<sup>122</sup> According to the LOKKER study, 12 percent of websites across all industries have the TikTok Pixel. The LOKKER study is comparable in size to the Feroot study. Both the Feroot and LOKKER studies determined the TikTok Pixel had a material presence on the internet.

119. Together, the studies show growth in the presence of the TikTok Pixel between 2023 (7.41 percent of websites) and 2024 (12 percent of websites). [REDACTED]

[REDACTED] In my analysis below, I take the average of these two values as my allocation factor, which is 9.7 percent.

120. Based on the market measure analysis, the quantification of damages for a representative class member is depicted by the following formula:

$$\text{Single Class Member Damages} = \text{Market Measure (\$3)} \times \text{No. of Months} \times \text{Weighting (X\%)}$$

121. The Weighting factor, X%, is either 100% or 9.7%, depending on whether the pixel website placement allocation is applied. Use of the allocation factor, 9.7 percent, is conservative. The market measure of \$3 per month per person represents an exchange between willing sellers (individuals) and buyers (Ipsos Screenwise and SavvyConnect) of the individual’s online browsing data. While the market measures can collect online browsing data, payment for this data is not contingent or connected to variations in browsing behavior (number of websites, time on websites, or category of websites). As noted above, an individual online for 7 days in a month would qualify for the same payment as someone online for 30 days in a month. In addition, the market measure payments are not sensitive to individuals’ practice or extent of pauses to tracking or browser shifting that effects transmission of data (when, for example, searching sensitive information). The market measures treat wide differences in

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<sup>122</sup> LOKKER, “Website Privacy and Compliance Challenges: Quantifying Website Privacy Risks,” Mar. 2024, available at [https://lokker.com/wp-content/uploads/2024/04/LOKKER\\_Online-Data-Privacy-Report\\_032024-2.pdf](https://lokker.com/wp-content/uploads/2024/04/LOKKER_Online-Data-Privacy-Report_032024-2.pdf), p. 2.

<sup>123</sup> See, e.g., [REDACTED] (TIKTOK-BG-000125306-381 at 350); [REDACTED] (TIKTOK-BG-000003014 at 3016).

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these practices as irrelevant to the level of payment. I understand TikTok's Pixel and Events API collect the website visitor's data at all times.

122. Ultimately, it is my economic opinion that the scale and scope of websites using the TikTok Pixel and Events API, the variation in amount of online data that leads to the same payment under the market measures, and the ability to pause the collection of data under programs corresponding to the market measures, leads to an elimination of the need for allocation factor.
123. With the number of months of data collected by TikTok through the TikTok Pixel or Events API for a Class Member, the damages formula is complete given the determination of the remaining parameters as discussed above (i.e., market measure amount of \$3, and weighting factor of either 100% or 9.7%).

**VI. ASSESSMENT OF STATUTORY DAMAGES**

124. I have also been requested by counsel to consider statutory damages. I understand California Penal Code § 637.2 sets \$5,000 per violation.<sup>124</sup> I understand the ECPA establishes statutory damages of the greater of \$100 per day of violation, or \$10,000, and there is a two-year statute of limitations.<sup>125</sup>
125. A starting point for the definition of a violation could be the number of Class Members (or the number of members in the other subclasses). However, I understand that violation is a concept that could even be applied as broadly as every time the Pixel fires for a website visited by a Class Member.

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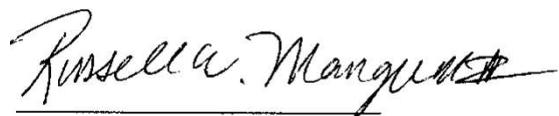
<sup>124</sup> Complaint, p. 53.

<sup>125</sup> 18 U.S. Code § 2520(c).

The initial complaint was filed May 26, 2023. Given that the Class Period starts March 2022, the statute of limitations would not be binding. Class Action Complaint, May 26, 2023.

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I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed on this, the 21st day of June, 2024, at Irvine, California.

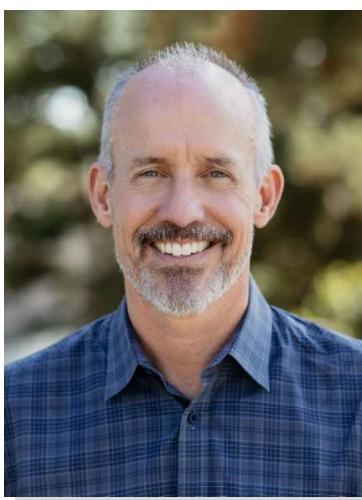
A handwritten signature in black ink, appearing to read "Russell W. Mangum III". The signature is fluid and cursive, with "Russell W." on top and "Mangum III" below it.

Russell W. Mangum III



## APPENDIX 1

### RUSSELL W. MANGUM III



4 Park Plaza  
Suite 1930  
Irvine, CA 92614

T (949) 594-1601 o  
T (714) 714-6529 m  
mangum@cirqueanalytics.com

#### **CURRENT POSITION**

Executive Vice President, Cirque Analytics; 2021–present

#### **EDUCATION**

Ph.D., Economics, University of Southern California, 1995  
M.A., Economics, University of Southern California, 1992  
M.A., Christian Apologetics (highest hons) Biola University, 2023  
B.A., Economics (hons), Calif. State University, Fullerton, 1988

#### **SPECIALIZED EXPERIENCE, RESEARCH, OR INTEREST**

Antitrust; Commercial Disputes; Intellectual Property; Statistics and Econometrics, Valuation

#### **PAST POSITIONS**

2013–2022	Professor, Economics, Concordia University Irvine (retired)	Irvine, CA
2021	Visiting Researcher, Univ of Winchester, Sch of Bus, Law, and Tech	Winchester, UK
2007–2021	Senior Vice President, Nathan Associates Inc.	Irvine, CA
2002–2012	Associate Adjunct Professor, Economics, Univ of Southern California	Los Angeles, CA
2001–2007	Vice President, Analysis Group, Inc.	Los Angeles, CA
2001	Manager, PricewaterhouseCoopers, Financial Advisory Services	Los Angeles, CA
1998–2001	Managing Associate, Nathan Associates Inc.	Arlington, VA
1998–2000	Adjunct Professor, Economics, Johns Hopkins University	Washington, DC
1995–1998	Economist, U.S. Federal Trade Commission	Washington, DC

#### **COURSES TAUGHT**

Principles and Intermediate Economics, Managerial Economics, Statistics and Econometrics, Finance and Financial Markets, Environmental Economics, Business Info. Technology, Advanced Topics in Economics

#### **EXPERIENCE SUMMARY**

Dr. Mangum has over 30 years of experience in economic analysis, research, and teaching. His consulting practice centers on economic analysis and damages in matters related to IP and technology, antitrust, and complex commercial disputes, with particular application to class certification, statistical analysis, and use of survey data. Dr. Mangum's experience as an expert is extensive, with testimony in over 125 matters before local, state, and federal courts. Dr. Mangum has taught graduate and undergraduate courses in economics, statistics, finance, and econometrics at several universities, including Johns Hopkins, USC, Pepperdine and Concordia University Irvine. Dr. Mangum's career has included employment by Nathan Associates, Inc., Analysis Group, PricewaterhouseCoopers, and The US Federal Trade Commission.

## PROFESSIONAL EXPERIENCE

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### *Intellectual Property*

Dr. Mangum has substantial experience in the area of intellectual property damages, including claims related to infringement of patents; FRAND licensing commitments; patent pools; copyrights; and trademarks; as well as theft of trade secrets; false designation of origin; and false advertising. The case contexts in which Dr. Mangum has performed these analyses include:

- Patent infringement and disputes related to:
  - Computer, electronics, and telecommunication industry:
    - Cellular communication network technology;
    - Modem communication devices;
    - Wireless communication network devices (routers, cards, including under FRAND licensing commitments);
    - Handheld device navigation applications;
    - NIC hardware and chipsets;
    - Semiconductors;
    - Webswitching and IP router network hardware;
    - Wired and wireless portable electronic temperature sensor devices;
    - Electronic eReader devices;
    - Digital TV Tuners under FRAND licensing commitments;
    - Automated lip-sync animation used in video games;
    - Data encryption devices.
    - VoIP network telephony services.
  - Medical devices:
    - Artificial vertebral disc implants;
    - Trocar seals for laparoscopic surgery;
    - Spinal fusion implants;
    - Breast biopsy devices;
    - Remote medical information monitoring technology;
    - Intraarterial guidewire and embolic filter devices.
  - Energy
    - Specialized valves used in oil refining;
    - Electric utility management systems;
    - Wide-area real time phasor measurement and monitoring.
  - Food and agriculture:
    - Additive-infused confections;
    - Nutritional supplements;

- New variety of late ripening white grapes;
- Structures and methods utilized in the growing of grapes and raisins;
- Cold extraction coffee processes.
- Business software
  - eProcurement;
  - Business intelligence;
  - Design and simulation;
  - Call routing software;
  - Computer tracking;
  - Program and application management;
- Clothing and clothing design
  - Padded athletic shirts/pants; shoes; headwear; accessories;
- Miscellaneous
  - Electronic nicotine delivery systems (NDS)
  - Personal watercraft devices and accessories
  - Consumer advertising design via use of digital media
  - Automated stapling machines used in bed manufacturing
  - Specialized hardware and control systems used in high-rise elevators
  - Electronic exchange systems for trading of commodities futures contracts
  - Electronic data management system used in public transportation projects
  - Document and print inspection systems
- Trademark, trade dress, or copyright infringement related to:
  - Environmental Cleanup/Transport/Disposal Services
  - IT Network equipment (transceivers and switches);
  - Sponsorship with motorsports, automotive repair tools and devices, beverages and snacks, and apparel;
  - Banking services;
  - Skincare and cosmetics;
  - Real estate property acquisition services;
  - Online dining reservation and payment services;
  - Internet search engine terms related to retail sales of food and arranged food products;
  - Enterprise Resource Planning (ERP) software;
  - Veterinary Teleradiology (online/internet) Services;
  - Devices and software for online mobile device data extraction and IT network devices;
  - Clothing, shoes, and jewelry;

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- Advertising and marketing through wireless mobile communications;
- Motion picture trademarks in the manufacture of clothing;
- Furniture products (mechanized and non-mechanized);
- Portable combustion engines and portable air compressors
- Infant care products;
- Homeopathic products;
- Postal measuring products;
- Scented candle products;
- Children's toys;
- Art and art exhibits
- Design plans for a theme amusement park.
- Theft of trade secrets related to:
  - Neuroendovascular coils and catheters;
  - Cold extraction coffee processes
  - Electronic mechanisms for payment processing;
  - Technical documents, Product features, customer data, and marketing methods/models related to Systems for General Floor Hospital Monitoring of patient vital statistics;
  - Training methods, pricing models, and customer status databases related to Enterprise Resource Planning (ERP) software;
  - Customer data and information, and pricing models related to employee pension and benefits insurance brokerage services;
  - Government contracted research into laser vibrometry;
  - Devices and software for mobile device data extraction;
  - IT system design and implementation for the US defense industry;
  - Electronic engineering and CAD packages used in US naval warcraft architecture;
  - Methods for mathematical simulations for the pricing of mortgage backed securities;
  - Soy coffee alternative products;
  - Design, development, marketing, and manufacturing of toys;
  - Computer game accessories.
- False advertising, false designation of origin, or unauthorized use of likeness related to:
  - Chemical dependence treatment services;
  - Real estate property acquisition services;
  - Security monitoring systems and services;
  - Consumer appliances;
  - Medical data printer systems;
  - Furniture products;

- Composed music and lyrics used in television commercials;
- Restaurant meals and shopping services;
- Internet advertising services via advertorial placement on publishers' websites;
- Nutritional supplements and beverages;
- Orthodontic and Dental devices and services;

### Competition/Antitrust

Dr. Mangum has substantial experience in the area of competition and antitrust, including analyses of relevant product and geographic markets, market power, monopolization, and likelihood of monopolization from impending events. These analyses usually include statistical and econometric analysis of market data to identify the extent of competition, and the magnitude of competition. The case contexts in which Dr. Mangum has performed these analyses include:

- Evaluated common impact and estimated damages, for direct and indirect purchasers, from price fixing and other conspiracies, including the markets for commercial tissue paper, bulk vitamins, high-end automobiles, ready mix concrete, consumer apparel, Korean noodles, packaged seafood, meat products, interior molded doors, airline travel, and pharmaceuticals.
- Evaluation of alleged competitive foreclosure in the market for sleep apnea products, including relevant markets, market power, and lost profits damages.
- Evaluation of alleged price discrimination across dealers of hardscape building materials.
- Evaluation of antitrust claims and affirmative defenses of patent misuse related to required terms in patent license programs for flash memory semiconductors and systems.
- Evaluation of market segments, market channels, and cost pass-through in the market for DRAM-containing products and NFL brand apparel.
- Estimation of damages related to:
  - A conspiracy to boycott developments in DRAM packaging;
  - Foreclosure of competition in market for footwear insoles and inserts.
- Evaluation of competitive effects of exclusive dealing clause in a franchise agreement.
- Evaluated the competitive effects of exclusive dealing policies regarding:
  - Acute care hospital and physician services;
  - Customer purchase data exchange related to direct mail advertising and sales;
  - Free standing insert advertising (coupon) services;
  - Replacement parts for 3-piece body welder systems;
  - Interconnect agreements between internet backbone communication services;
  - Supply of biological inputs used in creating generic biologic therapeutic treatments;
  - Professional sports branded athletic apparel;
  - Durable medical equipment;
  - Pharmaceuticals.

- Analyzed the competitive effects from wrongful patent application and issuance (fraud on the patent office) related to processes and mechanisms for food preparation and processing.
- Analyzed the likely competitive effects of proposed mergers in various industries, including hospital services, physician services, pharmaceuticals, medical insurance, construction aggregates, supermarkets, auto parts, cable systems and programming, industrial refractories, and computer game software.

### Commercial Disputes

- Evaluated damages related to a data breach and the improper capture and transmission of personalized information held and maintained in commercial database(s).
- Evaluated damages related to alleged breach of contract involving collection and retention of personalized information connected to web browsing activity.
- Evaluated damages related to alleged breach of contract involving online storage agreements.
- Evaluated claims of damages related to attempted sale of cold extraction coffee company and the discovery of patents allegedly based on confidential information.
- Evaluated claims of damages related to failure to close a sale for multiple solar energy production properties/companies.
- Estimated damages in the form of lost profits from breach of contract in a services joint venture involving use of indexes and associated data for creation and analysis of international financial securitized and derivatives.
- Estimated damages in the form of disgorgement and lost company value related to brokerage services involving employee pension and benefit programs.
- Evaluated claims of replacement cost and lost profits damages related to alleged interference in the market for femtocell wireless communication products.
- Evaluated claims of damages in the form of lost profits and disgorgement of compensation and benefit from alleged unauthorized use of confidential materials in the market for government contracts for research into laser vibrometry.
- Estimated damages from employee theft of HDD computer memory products from a research/testing facility. Calculated value based on historical in-channel market price and on historical costs of manufacturing and sales.
- Evaluated claims of lost profits damages arising from alleged professional malpractice related to commercial development and land use.
- Provided statistical and data analysis of invoices for disaster recovery and construction services. Estimated lost profits related to alleged fraud, breach of contract, and tortious interference.
- Estimated damages related to alleged breaches of contract, including:
  - Contract involving the development and sale of solar power generation projects;
  - Contract involving the supply of active ingredients in nutraceuticals;
  - Non-solicitation agreement between government defense contracting companies;
  - Contract for concession services at amusement parks;
  - Contract for creation and promotion of credit reporting services;
  - Contract for supply of MLB jerseys used in creation of sports memorabilia;
  - Contract for blending and supply contracts for specialized non-dairy beverages;

- Non-compete clauses (restaurant lease, franchising, structural steel fabrication);
- Contract for earning and redeeming of frequent flyer miles;
- Contract for purchase of television airtime on a local over-the-air station;
- Contract for representation and sale of television programming;
- Royalty contract regarding design and functionality elements use in toys;
- Contract for technology and support from software conference bridge systems;
- Contract for conference calling services and long-distance calls connection services.
- Estimated damages from defamation related to the launch of a clinic for medical disorders.
- Evaluated claims by the CA Coastal Commission related to lost recreational value from proposed coastal bluff seawall construction.
- Evaluated concepts and methods for calculating proceeds from a Qi Tam suit related to improper medical lab billing practices.
- Estimated damages related to Quantum Meruit claims involving use of software to manage viewing and storage of electronic medical images.

### **Employment and Labor**

- Estimated damages related to lost profits; lost company value, employee training and hiring expense, and/or disgorgement of defendant's profits in multiple cases related to the alleged breach of non-solicitation agreements and unauthorized use of confidential information by departing employees the insurance and MLM health and wellness industries.
- Estimated lost profits damages and/or disgorgement of defendant's profits in multiple cases related to the alleged breach of non-solicitation agreements and unauthorized use of confidential information involving government defense contracting companies.
- Estimated plaintiff's lost profits and disgorgement of defendant's profits related to the theft of trade secrets by departing employees in the automated emergency/disaster response industry.
- Estimated disgorgement of defendant's profits related to the theft of trade secrets by departing employees in the naval engineering industry.
- Provided statistical analysis of employee timecard and pay data to estimate instances of underpayment or missed breaks.
- Estimated lost earnings and compensation damages related to an alleged wrongful termination of an employee; evaluated lost wages/earnings, lost retirement benefits, and lost compensation through stock options.
- Estimated damages to an employee/inventor related to exclusion as an inventor from PCT applications following termination from a start-up medical devices company; evaluated the plaintiff's claims of lost share of proceeds from technology share.

### **Statistical and Econometric Analysis**

- Performed regression analysis to evaluate class-wide damages related to class certification in the context of various alleged conspiracies, in several industries and markets including:

- Ready-mix concrete; Korean Ramen; Interior molded doors; Packaged Seafood; Trans-Pacific airline travel; Broiler chickens; Domestic airlines travel; Pork; Turkey;
- Performed regression analysis to evaluate class-wide cost pass-through in the context of multiple alleged antitrust conspiracies (including building materials, airline travel, food products, apparel, and DRAM).
- Evaluated regression and statistical analysis offered in support of damages related to an alleged breach of non-solicitation agreements and unauthorized use of confidential information by departing employees the insurance and MLM health and wellness industries.
- Evaluated regression and statistical analysis offered in support of damages and common impact in an indirect purchaser class action related to alleged false advertising for nutritional supplement beverages.
- Provided statistical analysis of employee timecard and pay data to estimate instances of underpayment or missed breaks.
- Provided sampling techniques and statistical analysis of customer service database to estimate the extent of use of an allegedly infringing feature in a commercial router.
- Evaluated sampling techniques and extrapolation estimates related to allegedly improper medical billing practices and in the context of damages related to construction defects.
- Provided statistical and econometric analysis of survivorship related to consumer membership attrition in credit reporting programs.
- Provided statistical and econometric analysis of the correlation between purchase of infringing products and consequential purchase of related services.
- Provided statistical analysis and estimate of medical product sales in the absence of data from third party sales force.
- Provided statistical and econometric analysis of conference calling minutes related to alleged intentional interference and unfair competition.
- Conducted statistical analysis of incremental costs in support of lost profits calculations.

## **EXPERT WITNESS EXPERIENCE (SINCE 2019)**

- *American Compliance Technologies Inc., v. Advanced Chemical Transport Inc.*, United States District Court, Middle District of Florida, Tampa Division (2024). Submitted an expert report on behalf of counterclaimants related to the alleged trademark infringement involving environmental clean-up, transport, and disposal services.
- *In Re Pork Antitrust Litigation*, United States District Court, Northern District of Minnesota (2024). Provided testimony in depositions (3) and issued multiple reports on behalf of plaintiff class related to the economic effects of an alleged conspiracy to constrain capacity and increase prices in the pork industry.
- *Lisa Bodenborg v. Apple Inc.*, United States District Court, Northern District of California (2024). Submitted an expert report on behalf of plaintiff class related to damages involving alleged breach of contract for cloud storage services.
- *Tyler Baker et al. v. ParkMobile LLC*, United States District Court for the Northern District of Georgia, Atlanta Division (2024). Submitted an expert report on behalf of plaintiff class related to damages involving a data breach and the improper capture and transmission of personalized information held and maintained in commercial database(s).
- *In Re Broiler Chicken Antitrust Litigation*, United States District Court, Northern District of Illinois (2024). Testified at a bench trial (evidentiary hearing), and in depositions (4), and issued multiple expert reports on behalf of plaintiff class related to the economic effects of an alleged conspiracy to constrain capacity and increase prices in the broiler chicken industry.
- *In Re: Packaged Seafood Products Litigation*, United States District Court, Southern District of California (2024). Provided testimony in depositions (3), testified at trial (evidentiary hearing), and issued multiple expert reports on behalf of direct purchaser plaintiff class related to class certification and estimation of class wide damages in an antitrust case involving alleged collusion on the prices for packaged seafood.
- *MSP Recovery Claims Series v. Express Scripts Inc., et al.*, United States District Court, Northern District of Illinois, Western Division, (2023). Provided deposition testimony on behalf of plaintiff classes (direct and indirect) and issued multiple expert reports related to the economic effects of an alleged anticompetitive practices involving the pharmaceutical drug Acthar.
- *Q Industries Inc. v. O'Reilly Automotive Inc., et al.*, United States District Court, Northern District of California (2023). Provided deposition testimony and issued an expert report on behalf of O'Reilly defendant related to alleged trademark infringement involving retail supply of automotive equipment.
- *Q Industries Inc. v. Test-Rite Products Corp., et al.*, United States District Court, Northern District of California (2023). Provided deposition testimony, and issued an expert report on behalf of defendant Test-Rite Corp. related to alleged trademark infringement involving wholesale supply of automotive equipment.
- *In Re Turkey Antitrust Litigation*, United States District Court, Northern District of Illinois, Eastern Division (2023). Provided deposition testimony, and issued multiple expert reports on behalf of plaintiff class related to the economic effects of an alleged conspiracy to increase prices and restrain supply in the turkey industry.
- *MGA Entertainment Inc. v. Clifford "T.I." Harris, et al.*, United States District Court, Central District of California, Western Division (2023). Testified at trial and deposition, and issued multiple expert reports on behalf of counter-defendant related to misappropriation of intellectual property (name, likeness, trade dress) related to the promotion and sale of toys.

- *Microvention Inc. v. Balt USA, LLC, et al.*, United States District Court, Central District of California (2023). Provided deposition testimony, and issued an expert report on behalf of Defendant involving damages related to alleged misappropriation of trade secrets involving neuroendovascular medical devices.
- *In Re Blackbaud, Inc. Customer Data Security Breach Litigation*, United States District Court for the District of South Carolina, Columbia Division (2023). Provided deposition testimony, and issued an expert report on behalf of plaintiff class related to damages involving a data breach and the improper capture and transmission of personalized information held and maintained in commercial database(s).
- *Dr. Joseph Ciccio, et al., v. SmileDirect Club Inc., et al.*, United States District Court, Middle District of Tennessee, Nashville Division, (2022). Provided deposition testimony, and issued an expert report on behalf of plaintiff class involving damages related to allegations of false statements regarding orthodontic and dental treatment.
- *Lauren Adele Oliver v. Meow Wolf Inc., et al.*, United States District Court for the District of New Mexico (2022). Provided deposition testimony, and issued an expert report on behalf of plaintiff involving damages related to alleged copyright infringement involving art and art exhibits.
- *Sprint Communications Company LP v. Cequel Communications, LLC, et al.*, United States District Court, District of Delaware (2022). Testified at a bench trial (evidentiary hearing), and in deposition, and issued multiple expert reports on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.
- *VRtoysone, LLC, et al v. Disney Interactive Studios, Inc.*, United States District Court, Central District of California, Western Division (2022). Submitted an expert report on behalf of Defendant involving damages related to alleged patent infringement involving video games.
- *Patrick Calboun, et al. v. Google LLC*, United States District Court, Northern District of California (2021). Provided testimony in depositions (2) , and issued multiple expert reports on behalf of plaintiff class involving damages and common impact related to alleged breach of contract involving the collection and retention of personalized information connected to web browsing activity.
- *CPI Security Systems Inc. v. Vivint Smart Home Inc. et al.*, United States District Court, Western District of North Carolina, Charlotte Division (2021). Provided deposition testimony, and issued an expert report on behalf of plaintiff involving unjust enrichment and royalty damages related to alleged false advertising and unfair competition related to security monitoring systems and services.
- *Martifer-Silverado Fund I, LLC and Silverado Power LLC v. Talesun Solar USA, Ltd.*, Superior Court of California, San Francisco County (2021). Provided trial and deposition testimony on behalf of Defendant, related to alleged breach of contract involving solar energy projects.
- *Javo Beverage Co., Inc., v. Stephen Corey*, American Arbitration Association (2021). Provided trial (arbitration) and deposition testimony on behalf of respondent related to breach of contract and misappropriation of confidential information and technology in the market for coffee extracts.
- *Andrea Williams and James Stewart (class reps) v. Apple Inc.*, United States District Court, Northern District of California (2021). Submitted an expert report, and issued an expert report on behalf of plaintiffs related to damages involving alleged breach of contract regarding provision of electronic file storage.

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- *QC Manufacturing, Inc., v. Solatube International, Inc. and Brighter Concepts, Inc. dba Solatube Home Daylight*, JAMS Arbitration, Los Angeles, CA (2020). Provided trial (arbitration) testimony, and issued an expert report on behalf of complainant related to a breach of contract (litigation settlement agreement) involving whole house fans.
- *In Re Domestic Airline Travel Antitrust Litigation*, United States District Court, District of Columbia (2020). Provided deposition testimony, and issued multiple expert reports on behalf of plaintiff class related to the economic effects of an alleged conspiracy to constrain capacity in the domestic airline travel industry.
- *RV Skincare Brands LLC v. Dighy investments Ltd., Quickbox LLC, et al.*, United States District Court, Southern District of New York (2020). Submitted an expert report on behalf of certain defendant related to damages from alleged counterfeit sales and trademark infringement involving fulfillment of skincare product commerce.
- *Cisco Systems Inc. et al. v. Zahid Hassan Sheikh et al.*, United States District Court, Northern District of California (2020). Provided deposition testimony, and issued an expert report on behalf of certain defendants related to damages from alleged counterfeit sales and trademark infringement involving transceiver and switching IT network equipment.
- *San Diego County Credit Union v. Citizens Equity First Credit Union*, United States District Court, Southern District of California (2020). Provided deposition testimony, and issued an expert report on behalf of plaintiff related to damages flowing from fraudulent declaration in the registration of a trademark involving credit unions.
- *Sprint Communications Company LP v. Atlantic Broadband Finance LLC, et al.*, United States District Court, District of Delaware (2020). Provided deposition testimony, and issued multiple expert reports on behalf of plaintiff related to lost profits royalty damages from alleged patent infringement involving VoIP telephony network services.
- *Sprint Communications Company LP v. Charter Communications Inc. et al.*, United States District Court, District of Delaware (2020). Provided deposition testimony, and issued multiple expert reports on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.
- *Sprint Communications Company LP v. Mediacom Communications Corp.*, United States District Court, District of Delaware (2020). Provided deposition testimony, and issued multiple expert reports on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.
- *Sprint Communications Company LP v. TPC Global LLC et al.*, United States District Court, District of Delaware (2020). Provided deposition testimony, and issued multiple expert reports on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.
- *Sprint Communications Company LP v. Wideopenwest Inc. et al.*, United States District Court, District of Delaware (2020). Provided deposition testimony, and issued multiple expert reports on behalf of plaintiff related to lost profits and royalty damages from alleged patent infringement involving VoIP telephony network services.

- *SE&P Dow Jones Indices LLC and SPDJ Singapore Pte Ltd. v. BSE Ltd.*, United States District Court, Northern District of California (2020). Provided trial (tribunal) testimony, and issued an expert report on behalf of claimants and counter-respondants for an arbitration concerning damages from breach of contract in a service joint venture related to the use of indexes and associated data for creation and analysis of international financial securitized and derivatives.
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American Bar Association, member

American Economic Association, member

Licensing Executives Society, member, chapter chair

Los Angeles County Bar Association, member

Los Angeles Intellectual Property Law Association, member

Orange County Bar Association, member

Orange County Patent Law Association, member

## Appendix 2: Materials Considered

### Legal Materials

- Class Action Complaint, May 26, 2023
- Defendants Amended Responses And Objections To Plaintiff Bernadine Griffith's First Set Of Interrogatories (Nos. 1–2), Nov. 21, 2023
- Defendants Amended Responses And Objections To Plaintiffs' First Set Of Requests For Production Of Documents And Things (Nos. 1–59), Dec. 22, 2023
- Defendants Amended Responses And Objections To Plaintiffs' Fourth Set Of Interrogatories To Defendants (Nos. 16–17), Mar. 20, 2024
- Defendants Amended Responses And Objections To Plaintiffs' Fourth Set Of Requests For Production Of Documents And Things (Nos. 73–81), Jan. 5, 2024
- Defendants Amended Responses And Objections To Plaintiffs' Second Set Of Interrogatories (Nos. 3–14), Apr. 16, 2024
- Defendants Amended Responses And Objections To Plaintiffs' Second Set Of Interrogatories (Nos. 3–14), Dec. 22, 2023
- Defendants Amended Responses And Objections To Plaintiffs' Second Set Of Requests For Production Of Documents And Things (Nos. 60–68), Dec. 22, 2023
- Defendants Amended Responses And Objections To Plaintiffs' Third Set Of Interrogatories (No. 15), Jan. 19, 2024
- Defendants First Set Of Interrogatories (Nos. 1–12), Sept. 1, 2023
- Defendants First Set Of Interrogatories To Plaintiff Jacob Watters (Nos. 1–12), Nov. 2, 2023
- Defendants First Set Of Interrogatories To Plaintiff Matthew Rauch (Nos. 1–12), Nov. 2, 2023
- Defendants First Set Of Interrogatories To Plaintiff Patricia Shih (Nos. 1–12), Nov. 2, 2023
- Defendants First Set Of Interrogatories To Plaintiff Philip Cantore (Nos. 1–13), May 17, 2024
- Defendants First Set Of Interrogatories To Plaintiff Rhonda Irvin (Nos. 1–12), Nov. 2, 2023
- Defendants First Set Of Requests For Production Of Documents And Things (Nos. 1–35), Sept. 1, 2023
- Defendants First Set Of Requests For Production Of Documents And Things To Plaintiff Jacob Watters (Nos. 1–32), Nov. 2, 2023
- Defendants First Set Of Requests For Production Of Documents And Things To Plaintiff Matthew Rauch (Nos. 1–34), Nov. 2, 2023
- Defendants First Set Of Requests For Production Of Documents And Things To Plaintiff Patricia Shih (Nos. 1–36), Nov. 2, 2023
- Defendants First Set Of Requests For Production Of Documents And Things To Plaintiff Philip Cantore (Nos. 1–68), May 17, 2024
- Defendants First Set Of Requests For Production Of Documents And Things To Plaintiff Rhonda Irvin (Nos. 1–32), Nov. 2, 2023
- Defendants Responses And Objections To Plaintiff Bernadine Griffith's First Set Of Requests For Production Of Documents And Things (Nos. 1–59), Aug. 10, 2023
- Defendants Responses And Objections To Plaintiff Bernadine Griffith's First Set Of Interrogatories (Nos. 1–2), Sept. 25, 2023
- Defendants Responses And Objections To Plaintiffs' Eleventh Set Of Requests For Production Of Documents And Things (Nos. 141–142), June 12, 2024
- Defendants Responses And Objections To Plaintiffs' Fifth Set Of Interrogatories To Defendants (No. 18), Apr. 17, 2024
- Defendants Responses And Objections To Plaintiffs' Fifth Set Of Requests For Production Of Documents And Things (No. 82), Jan. 2, 2024

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- Defendants Responses And Objections To Plaintiffs' Fourth Set Of Interrogatories To Defendants (Nos. 16–17), Feb. 20, 2024
- Defendants Responses And Objections To Plaintiffs' Fourth Set Of Requests For Production Of Documents And Things (Nos. 73–81), Dec. 11, 2023
- Defendants Responses And Objections To Plaintiffs' Second Set Of Interrogatories (Nos. 3–14), Nov. 20, 2023
- Defendants Responses And Objections To Plaintiffs' Second Set Of Requests For Production Of Documents And Things (Nos. 60–68), Nov. 20, 2023
- Defendants Responses And Objections To Plaintiffs' Seventh Set Of Requests For Production Of Documents And Things (Nos. 91–103), Apr. 17, 2024
- Defendants Responses And Objections To Plaintiffs' Sixth Set Of Requests For Production Of Documents And Things (Nos. 83–90), Feb. 20, 2024
- Defendants Responses And Objections To Plaintiffs' Tenth Set Of Requests For Production Of Documents And Things (Nos. 125–140), June 5, 2024
- Defendants Responses And Objections To Plaintiffs' Third Set Of Interrogatories (No. 15), Jan. 2, 2024
- Defendants Responses And Objections To Plaintiffs' Third Set Of Requests For Production Of Documents And Things (Nos. 69–72), Nov. 30, 2023
- Defendants Responses And Objections To Plaintiffs' Twelfth Set Of Requests For Production Of Documents And Things (Nos. 143–144), June 19, 2024
- Defendants Second Set Of Interrogatories To Plaintiff Bernadine Griffith (No. 13), May 17, 2024
- Defendants Second Set Of Interrogatories To Plaintiff Jacob Watters (No. 13), May 17, 2024
- Defendants Second Set Of Interrogatories To Plaintiff Patricia Shih (No. 13), May 17, 2024
- Defendants Second Set Of Requests For Production Of Documents And Things (Nos. 36–93), Feb. 22, 2024
- Defendants Second Set Of Requests For Production Of Documents And Things To Plaintiff Jacob Watters (Nos. 33–70), May 17, 2024
- Defendants Third Set Of Requests For Production Of Documents And Things To Plaintiff Bernadine Griffith (Nos. 94–113), May 17, 2024
- Defendants Third Set Of Requests For Production Of Documents And Things To Plaintiff Patricia Shih (Nos. 37–90), May 17, 2024
- Defendants' Amended Response and Objections to Plaintiffs' Fourth Set of Document Requests, Jan. 5, 2024
- Defendants' Amended Responses and Objections to Plaintiff's First Set of Interrogatories (Nos. 1–2), Nov. 21, 2023
- Defendants' Amended Responses and Objections to Plaintiff's Fourth Set of Interrogatories (Nos. 16–17), Mar. 20, 2024
- Defendants' Amended Responses and Objections to Plaintiffs' First Set of Requests for Production of Documents and Things (Nos. 1–59), Dec. 22, 2023
- Defendants' Amended Responses and Objections to Plaintiffs' Second Set of Interrogatories (Nos. 3–14), Apr. 16, 2024
- Defendants' Amended Responses and Objections to Plaintiffs' Second Set of Interrogatories (Nos. 3–14), Dec. 22, 2023
- Defendants' Amended Responses and Objections to Plaintiffs' Second Set of Requests for Production of Documents and Things (Nos. 60–68), Dec. 22, 2023
- Defendants' Amended Responses and Objections to Plaintiffs' Third Set of Rogs and Verification, Jan. 19, 2024
- Defendants' Answer to Plaintiffs' First Amended Complaint, Dec. 26, 2023

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- Defendants' Responses and Objections to Plaintiff's Ninth Set of Requests for Production of Documents and Things (Nos. 111–122), May 15, 2024
- Defendants' Responses and Objections to Plaintiffs' Fourth Set of Document Requests, Dec. 11, 2023
- Defendants' Responses and Objections to Plaintiffs' Fourth Set of Interrogatories (Nos. 16–17), Feb. 20, 2024
- Defendants' Responses and Objections to Plaintiffs' Second Set of Interrogatories (Nos. 3–14), Nov. 20, 2023
- Defendants' Responses and Objections to Plaintiffs' Second Set of RFP of Documents and Things (Nos. 60–68), Nov. 20, 2023
- Defendants' Responses and Objections to Plaintiffs' Seventh Set of Requests for Production of Documents and Things (Nos. 91–103), Apr. 17, 2024
- Defendants' Responses and Objections to Plaintiffs' Sixth Set of Requests for Production of Documents and Things (Nos. 83–90), Feb. 20, 2024
- Defendants' Responses and Objections to Plaintiffs' Third Set of Interrogatories (No. 15), Jan. 2, 2024
- Defendants' Supplemental Memorandum in Opposition to Plaintiff's Motion to Compel Discovery Regarding Websites with TikTok SDK Installed, Damages Calculation, and Custodians, Oct. 6, 2023
- First Amended Complaint, Oct. 20, 2023
- Joint Stipulation Regarding Plaintiff's Motion to Compel Discovery Regarding Websites with TikTok SDK Installed, Damages Calculation, and Custodians, Sept. 28, 2023
- Notice of Voluntary Dismissal Without Prejudice by Matthew Rauch, Dec. 4, 2023
- Order Granting in Part and Denying Part Defendants' Motion to Dismiss Plaintiffs' First Amended Complaint, Dec. 13, 2023
- Order Regarding Substitution of Plaintiff, Apr. 12, 2024
- Plaintiff Jacob Watters's Responses And Objections To Defendants' First Set Of Requests For Production (Nos. 1–32), Dec. 4, 2023
- Plaintiff Jacob Watters's Responses To Defendants' First Set Of Interrogatories (Nos. 1–12), Dec. 4, 2023
- Plaintiff Patricia Shih's Responses And Objections To Defendants' First Set Of Requests For Production (Nos. 1–36), Dec. 4, 2023
- Plaintiff Patricia Shih's Responses To Defendants' First Set Of Interrogatories (Nos. 1–12), Dec. 4, 2023
- Plaintiff Rhonda Irvin's Responses And Objections To Defendants' First Set Of Requests For Production (Nos. 1–32), Dec. 4, 2023
- Plaintiff Rhonda Irvin's Responses To Defendants' First Set Of Interrogatories (Nos. 1–12), Dec. 4, 2023
- Plaintiff's Eighth Set of Requests for Production of Documents and Things, Apr. 3, 2024
- Plaintiff's First Set Of Interrogatories To Defendants (Nos. 1–2), Aug. 25, 2023
- Plaintiff's Responses And Objections To Defendants' First Set Of Requests For Production (Nos. 1–35), Oct. 3, 2023
- Plaintiff's Responses And Objections To Defendants' Second Set Of Requests For Production (Nos. 36–93), Mar. 25, 2024
- Plaintiff's Responses To Defendants' First Set Of Interrogatories (Nos. 1–12), Oct. 3, 2023
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- Plaintiff's Supplemental Responses To Defendants' First Set Of Interrogatories (Nos. 1–12), Nov. 29, 2023
- Plaintiff's First Set of Requests for Production of Documents and Things (Nos. 1–59), June 27, 2023
- Plaintiffs' Eighth Set Of Requests For Production Of Documents And Things (Nos. 104–110), Apr. 15, 2024
- Plaintiffs' Eleventh Set Of Requests For Production Of Documents And Things (Nos. 141–142), May 10, 2024
- Plaintiffs' Fifth Set of Interrogatories to Defendants (No. 18), Mar. 18, 2024

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- Plaintiffs' Fifth Set Of Requests For Production Of Documents And Things (No. 82), Nov. 30, 2023
- Plaintiffs' Fourth Set Of Interrogatories To Defendants (Nos. 16–17), Jan. 19, 2024
- Plaintiffs' Ninth Set of Requests for Production of Documents and Things (Nos. 111–122), Apr. 15, 2024
- Plaintiffs' Requests For Production Of Documents And Things, Set 3 (Nos. 69–72), Oct. 31, 2023
- Plaintiffs' Requests For Production Of Documents And Things, Set 4 (Nos. 73–81), Nov. 10, 2023
- Plaintiffs' Second Set Of Interrogatories To Defendants (Nos. 3–14), Oct. 20, 2023
- Plaintiffs' Second Set Of Requests For Production Of Documents And Things (Nos. 60–68), Oct. 20, 2023
- Plaintiffs' Seventh Set of Requests for Production of Documents and Things (Nos. 91–103), Mar. 18, 2024
- Plaintiffs' Sixth Set Of Requests For Production Of Documents And Things (Nos. 83–90), Jan. 19, 2024
- Plaintiffs' Tenth Set Of Requests For Production Of Documents And Things (Nos. 125–140), May 6, 2024
- Plaintiffs' Third Set Of Interrogatories To Defendants (No. 15), Nov. 30, 2023
- Plaintiffs' Twelfth Set Of Requests For Production Of Documents And Things (Nos. 143–144), May 20, 2024
- Second Amended Class Action Complaint, Apr. 11, 2024
- Supplemental Memorandum in Support of Plaintiff's Motion to Compel Discovery Regarding Websites with TikTok SDK Installed, Damages Calculation, and Custodians, Oct. 6, 2023, and Exhibits
- Verification For Defendants' Amended Responses And Objections To Plaintiffs' Interrogatories, Set Two, Mar. 28, 2024

### Depositions and Exhibits

- Deposition of Branyak Shao, June 7, 2024
- Deposition of Daniel Kirchgessner, Apr. 17, 2024
- Deposition of Lizzie Li, June 5, 2024
- Deposition of Rebecca Wong, May 17, 2024

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Bates Numbered Documents on Following Page

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GRIFFITHTT002118	TIKTOK-BG-000003067
GRIFFITHTT002119	TIKTOK-BG-000003082
GRIFFITHTT002120	TIKTOK-BG-000003098
GRIFFITHTT002121	TIKTOK-BG-000003100
GRIFFITHTT002122	TIKTOK-BG-000003122
GRIFFITHTT002123	TIKTOK-BG-000003172
GRIFFITHTT002124	TIKTOK-BG-000003193
TIKTOK-BG-000000245	TIKTOK-BG-000003340
TIKTOK-BG-000000811	TIKTOK-BG-000005364
TIKTOK-BG-000000835	TIKTOK-BG-000005393
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TIKTOK-BG-000001335	TIKTOK-BG-000007849
TIKTOK-BG-000001568	TIKTOK-BG-000007908
TIKTOK-BG-000001576	TIKTOK-BG-000008008
TIKTOK-BG-000001641	TIKTOK-BG-000008020
TIKTOK-BG-000001909	TIKTOK-BG-000008030
TIKTOK-BG-000002001	TIKTOK-BG-000008052
TIKTOK-BG-000002112	TIKTOK-BG-000008071
TIKTOK-BG-000002185	TIKTOK-BG-000008145
TIKTOK-BG-000002238	TIKTOK-BG-000008221
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